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THE English Improver,

Or a New Survey of Husbandry.

Discovering to the Kingdome, That some Land, both Arrable and Pasture, may be Advanced Double or Treble; Other Land to a Five or Ten fold: And some to a Twenty fold Improvement: Yea, some now not worth above One, or Two Shillings, *per* Acree, be made worth Thirty, or Forty, if not more.

Clearly demonstrated from Principles of sound Reason, Ingenuity, and late but most certaine Reall Experiences.

Held forth under six Peeces of Improvement:

Viz.

1. *By Floating or Watering such Lands as are Capable thereof.*
2. *By Reducing Boggy or Drowned Land to sound Pasture.*
3. *By such a way of Ploughing and Corneing old Courser Pasture, as not to Impoverish it; And by such a Method of Enclosure, as shall provide for Poore, And all Interests without Depopulation.*
4. *By discovering Divers Materials for Soyle and Compost, with the nature and use of them, as both Tillage and Pasture be advanced as high as promised.*
5. *By such a New Plantation of divers sorts of Woods, as in Twenty yeares, they shall rise more than in forty yeares naturally.*
6. *By a more Moderate Improvement of other sorts of Lands, according to their Capacities they lye under, by more Common Experiences.*

By *Walter Blith* a Lover of Ingenuity.

Pro. 21. 5. *The thoughts of the diligent brings abundance. A diligent man stands before Kings.*
Eccles. 9. 10. *All* therefore *that thy hands shall finde to do, do it with all thy power, for there is neither wisdome nor knowledge in the grave whither thou goest*

London, printed for *J. Wright* at the Kings Head in the Old-Bayley. 1649

14178

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TO THE
RIGHT HONOURABLE
The Lord Generall *Cromwell*, and the Right Honorable the Lord Prefident, and the reft of that Moft Honourable Society of the Councill of STATE.

Right Honourable,

AS a Man, or Chriftian, out of pure love to Mankind, I chufe rather to caft my felf at Your Lordfhips Feet, and come under Your greateft Cenfure for this high Prefumption, than to omit fo neceffary a Duty and Difcovery as the fubftance of this Difcourfe Imports; Therefore dare not conceale the leaft inconvenience that may befall the Publique, but take boldneffe to

preſent my thoughts that Your non-apprehending the Prejudices hindering Improvement, nor clearely your owne Capacities to remove them, and may be want of opportunity to conſult about theſe leſſer things (though very great in themſelves (the practiſe whereof throughly promoted might make the greater more eaſie) compared with your weighty and preſent affaires, may in ſome meaſure be an accidental cauſe that Improvements of our Lands goe one no better, although materially the cauſe is in our owne ſloth, prejudice and ill husbandry. And though I dare not preſent this rude Treatiſe unto Your Honours, to crave ſo high Patronage, yet I ſhall adventure theſe many moſt humble Repreſentations of ſome Prejudices to Improvements that remaine founded by a Law; And of ſome other Obſtacles, as firmly rooted by Corruption, that without Your Honours Power, and Wiſedomes help therein, the Improvements here tendred will be in great meaſure hindered.

To the removall whereof, if Your Honours

nours ſhall ſee cauſe to give incouragement, either by an Addition of ſuch Lawes as ſhall appeare unto you wanting; or Repealing ſuch as hinder, I ſhall not queſtion but Mens ſpirits will be raiſed to ſuch Experimenting of the principles of Ingenuity, as that wee may ſee this Commonwealth ſoone raiſed to her utmoſt fruitfulneſſe and greateſt glory.

The particulars are too many here to diſcourſe at large; I ſhall therefore take boldneſſe to preſent ſome few, with ſome briefe Reaſons to evince rhe ſame; and they are very great diſcouragements to the Ingenuous and Active Proſecution of the Improvements of the Nation.

The firſt Prejudice is, That if a Tenant be at never ſo great paines or coſt for the Improvement of his Land, he doth thereby but occaſion a greater Rack upon himſelf, or elſe inveſts his Land-Lord into his coſt and labour *gratis*, or at beſt lyes at his Land-Lords mercy for requitall; which occaſions a neglect of all good Husbandry, to his owne, the Land, the Land-Lord, and the

the Common wealths suffering. Now this I humbly conceive may be removed, if there were a Law Inacted, by which every Land-Lord should be obliged, either to give him reasonable allowance for his cleare Improvement, or else suffer him or his to enjoy it so much longer as till he hath had a proportionable requitall: As in *Flanders* and else where, in hiring Leases upon Improvement, if the Farmer improve it to such a Rate above the present value, the Land-Lord gives either so many yeares purchase for it, or allowes him a part of it, or confirmes more time; of which the Tenant being secured, he would act Ingenuity with violence as upon his owne, and draw forth the Earth to yeeld her utmost fruitfulnesse; which once being wrought unto perfection, will easily be maintained and kept up at the height of fruitfulnesse, which will be the Common-wealths great advantage: Some Tenants have Advanced Land from Twenty pounds to Forty pounds *per an.* and depending upon the Land-Lords favour have been wip'd of all; and

Remedy

and many Farmers by this uncertainty have been impoveriſhed and left under great diſgrace, which might as well have beene advanced.

The ſecond prejudice is againſt that great Improvement by floating Lands, which expoſeth the Improver to ſute of Law for Turning a Watercourſe, by Millers or others, which are minded to moleſt the Improvement, Althongh the Improvement be ten fold greater than the Prejudice can be, & the Advantage be farre more publique than the others pretended loſſe can be, yet few dare adventure upon the worke for feare of being ſued or moleſted.

Many great Improvements have been, and are to this day hindred and lye dead, becauſe the Miller cannot be compounded with at any rate; ſome I know, whoſe Improvements might be Ten-fold and more, the Millers prejudice little, if any at all, becauſe your exact husbands ſo clear all their boggy, low parts, and ſome time by their large draines break through many ſprings and iſſuing waters that they carry a better

ſtreame

streame unto the Miller than he had before, and his Improvement shall be able to supply a great part of the Country with Hay and grasse where was before but little, and may be the Millers mill may be worth five or sixe pound *per an.* few worth ten, that usually stand upon these waters, and let him be damnified what ever he can, it is in no proportion to the Common-wealths losse to such an Improvement.

The third Prejudice is, where all mens Lands lie intermixed in Common Fields or Medowes; The Ingenuous are disabled to the Improving theirs, because others will not, neither sometimes can the Improvement be made upon any, unlesse upon all joyntly, or else upon an unsupportable Charge or Burthen. As also the not cutting straight such watercourses, of such brookes and gutters that are exceeding crooked, which some that would cannot, because of others interests that will not, abundance of the best land in this Nation is hereby lost, and wonderfull Improvements hindred, the waters raised, the lands flouded

flouded, sheep rotted, and cattell spoyled, all by this neglect.

The remedies to all the three aforesaid Prejudices, to resolve the greatest advantage to the Common-wealth, and then command them either unto a loving Conjunction in the Exchange and Improvement, or else disabling any one to hinder another that is desirous of it, giving such recompence for any dammage hee shall make, as shall be adjudged reasonable by indifferent men or competent Judges.

A Fourth is Unlimitted Commons, or Commoning with stint, upon any Heath, Moore, Forrest, or other Common; This is a great Prejudice to many poore men, both Cottyers and Land-Holders, who have not of their own to stock their Commons, and so lose all, that have least need, and for whom those Commons were chiefly intended: And also a great hinderance to all; for being without that, every man layes on at randome, and as many as they can get, and so Overstock the same, that ordinarily they pine and starve

their Goods therein; and once in foure or five yeares you shall observe such a Rott of Sheepe, that all that the Oppressor hath gained by eating out his poore Neighbours all the other yeares, is swept away in one, and so, little advantage redoundeth to any: So that many thousand Acres of Land are as it were useless, which were all men limited according to their Proportion of Land or Dwellings to which the Common is due, the poore that could not stock theirs, might set them, and reape some benefit by them: And were they easily stinted, their Commons might be as good as their owne Severals to every man that hath an interest.

A Fifth Prejudice is, A law wanting to compell all men to kill their Wonts or Moales; the good husband doth, and the slothfull man neglects it, and thereby raiseth such a Magazine or Nursery, that they cannot be destroyed, but as fast as one destroyes them, the other nurseth a fresh supply to fill the Country: the Prejudice is greater than can be reported.

The

The sixt Prejudice is the not compelling men to plant wood where they doe cut downe, then to set againe a treble proportion or more to what they doe destroy, especially now so much of the gallant wood of the Nation is exposed to sale: We forget that it is a mighty pillar in the upholding this poore Island, and how honourable a custome it is in other Nations, that looke what Timber they cut downe, they must plant five or ten times as much in stead thereof: And that all men might be compelled to plow their coarser, old, mossy, rushy, bankie pasture Lands, being now fittest for it, and will be bettered by it, and suffers for want of it, and the Country needs it, and none prejudiced: and for the best land every man left to his owne liberty.

A Seventh Prejudice is the want of a through searching of the Bowels of the Earth, a businesse more fit to be undertaken by the Honorable Representation of the whole Common-wealth, than by any particular man; Whence are all our

Mines of Lead, Tinne, Iron, Coales, and Silver Mines in *Wales*, were they not once hid, and as uncertain as we are now certain of them? & what ſhould hinder but that in many places elſe the like may be diſcovered? as ſuppoſe Coal in *Northhampton*, *Buckingham*, and *Oxf. Sh.* what a great benefit to thoſe Countries would it be? Nay, if ſome ſorts of Stone could bee but found out in ſome other parts, what might it ariſe unto? Nay, ſay that either Marle, Chalk, or Lime, or ſome other fat Earth could bee found in ſome parts where they are wanting, how much would it inrich thoſe parts? And who can ſay but Silver may as well be found in other places as in *Wales* or other parts of the World? I am ſure that no man knowes but he that hath ſearched it, and the hundred thouſand part of this Nation hath never yet been tryed.

The Eighth Prejudice may be the many Watermills, which deſtroy abundance of gallant Land, by pounding up the water to that height, even to the very top of the ground, and above the naturall height,

that

that it lyeth swelling, and soaking, and spewing, that it turneth very much land to a Bogg, or to mire, or else to Flagg and Rush, or Mareblab, which otherwise was as gallant land naturally as could be, I am confident many a thousand a yeare are thus destroyed, some mills worth above 10 or 12. pound *per an.* destroy lands worth 20. 30. or 40. *per an.* I know it of my owne knowledge, I had some few yeares since a Mill Dam in my land, which destroyed one halfe of a gallant meadow, meanes was used that it was removed, and that very land is returned to his perfect pureneſſe againe.

I prescribe not the utter destruction of all, of some I doe, and others to have their water brought to a lower gage, and where they are wanting, Wind-mills erected, as in all the Fen Country are no other, or else incouragement given to some that I am confident are able to discover a compleat way for grinding all sorts of Corn by the strength of horse and man as feasibly as malt is. I am able to give some assi-

stance

ſtance my ſelfe to this worke, but ſhall far prefer others thereto, A Gentleman that hath waded ſo deepely therein as hath diſcovered publiquely his model at Lambeth deſerveth great incouragement.

And the laſt though not the leaſt is the raigne of many abominable Luſts, as Sloth and Idleneſſe, with their Daughters, Drunkennes, Gaming, Licentious liberty. Were not the greateſt and beſt, and all men made to be uſefull to the body? why continue many men as members cut off from it, as if they were made to conſume it, are neither uſefull in their bodies, mindes, or purſes to the common good? how comes City and Country to bee filled with Drones and Rogues, our highwaies with hackers, and all places with ſloth and wickedneſſe? I ſay no more, but pray ſome quickning Act to the execution of our Lawes againſt theſe worſe than heatheniſh Abhominations.

All which, with many more great annoyances and Annuzances (though ſome may thinke every man will be ready to re-

move

move, but we being under ſuch a drowſie Age, that though each particular ſhall bee advantaged as well as the whole body, yet it will not be indeavored as far as I am able to ſee into mens mindes or practices) are no way poſsibly removeable, but by Your Honours either compelling them by acting Ingenuity themſelves, or elſe ſo incouraging others that are deſirous thereof, that None may Prejudice Improvements, by denying any liberty for carrying on the Worke, receiving reaſonable ſatisfaction for the Dammage. To which, if your Honours pleaſe to adde but one thing more, to give your beſt incouragements to all Ingenious honeſt-hearts, ſome ſuch there are that have more within them than they can expreſſe,& many ſuch you neede, and the Cõmon-wealth more,whom while you are carefull to countenance, from Huckſters and Impoſtors, God will either keepe you or inable you to diſcover, but if any one can make a cleare diſcovery of any new Invention for the advance of Lands, Trade, or Merchandize, If your Honours pleaſe to confirme

confirme it to him for a ſeaſon, to reinburſe himſelf a little, 't being uncõceivable what ſome Ingenuous men run themſelves out herein, I cannot ſee the leaſt Prejudice to any, but a great incouragement to all, nor can I have the leaſt glance homeward, though plain dealing be a jewell, I finding my poor plain principles will never reach the honour of an intire diſcovery, if I can either draw any thing to life out of the deep Judgements or opinion of the more learned, and have out any thing to a profitable experiment from my owne practice, and hereby gain opportunity to caſt it as a Freewill Offering into the Common Wealths Treaſury, as the beſt & all I have to give, is my utmoſt Emulation. All which humble Propoſals, though Unbeſeeming me to preſent, yet I hope wil not be thought Unworthy the grave and ſerious Conſideration of Your Honours Wiſedome, as being ſo much conducing to Publique Welfare, in which you are all ingaged; to whom in this your publique relation, I have ſaid ſo much as I muſt humbly

humbly beg your Honours pardon, and ſhall ſay no more becauſe in the ſucceeding Epiſtles your particular advantages will be cleared, and in the diſcourſe at large your ſelves diſcovered to be as much diſcovered to be as much concerned and as capeable (in the Common-wealths advantage) of as great if not greater Improvements upon all your owne particular Eſtates as any, which I leave before you untill the fitteſt ſeaſon for your Lordſhips Conſideration and actings, as may ſeeme to you moſt conducing to the good of all Concernements. The All-wiſe God guide you in your great Affaires, and make you glorioufly Inſtumentall to the proſperity of the Nations; Theſe are and ſhall be the unceſſant and Earneſt deſires of

Your Honours unworthieſt
Servant

WALTER BLITH.

The Epistle to the Industrious READER.

I Shall here through thy good acceptance of my former meane Peece, and earnest Importunity for the shaddowes or Pictures of those severall Tooles I offered, and some other particular additionall waies of Improvement I promised to discover, present them all unto thee if God shall please to assist it to the Compleatment; wherein I shall a little by way of Repagration in some parts underbuild, and some leane to, or lesse necessarie, quite pull downe of the old worke; and yet not deface it neither, although by my hands it will never be uniformable, onely may be wholsome and keepe warme in Winter: I shall therefore forbeare to mention here any of the particulars therein handled, but refer thee to the Booke it

ſelfe, yet ſhall let them know (beſides ſome illuſtrations upon ſome of the former paſſages) I ſhall cleare my promiſe in all particulars, as to the Lands Improvement, and give in as cleare a diſcovery of the Tooles as I can in their ſeverall figures. And by way of Addition, or as a ſecond part I ſhall hold forth how thou maieſt make great, and may be greater Improvements *then hath as yet been uſually made in* England *upon thy Lands divers other waies.*

As Firſt, in the Miſtery of Planting *all ſorts of fruits, with the ſpeedieſt raiſing them to perfection.*

Secondly, I ſhall endeavour the facilitating the great weight and burthen of the Plough, and give you the diſcription of ſome formes moſt ſutable unto eaſe and ſpeede, and hope thereby to take off a conſiderable ſtrength and charge from the Husbandmans daily toyle.

Thirdly, give in the beſt experienced way of planting Hemp and Flax, Rape and Cole ſeede, Oade, Hops, Saffron, Licoriſh, and ſome other of our Engliſh wealth.

Fourthly, I ſhall endeavour to diſcover by what

what meanes wee may possible raise the benefit of the Clover grasse. St. Foine La-lucerne *to the neareſt preſident to* France *and* Flanders, *for worth and qualitie as our Engliſh climate and beſt husbandly experience will admit.*

And Laſtly, ſhall take boldneſſe with my good friend M. Samuell Hurtlips *leave to paraphraſe a little upon moſt of thoſe deficiencies in husbandry which his friend chargeth us withall, of which we have more then a good many & not ſo few as he ſpeakes of, & reduce ſo many of them that I have not ſpoke to already in my firſt Edition unto Practicall husbandry that fall under any of my experiences (which though they bee but coruſe and meane, yet have beene gained hardly, by many toyleſome tedious Journeys, and very great and large expences) and for the further light and helpe to the cleare underſtanding of the Miſterie of Improvement (for ſo I call it, and ſo it will bee found when thou commeſt to the reall practiſe of it, and may be more miſterious then thy principles, cuſtomes, and experience will reach unto) I would direct thee a little to conſider, what hath been written in this kind by*

former gallant Instruments worthy of perpetuall honour. Mr Markham *did excellently for his time, so did Mr* Gouge *in his Husbandry; Mr* Tusser *rimes out his expeces to good purpose, and in all their bookes thou maist finde out many things worth thy observation. Sir* Francis Bacons *Naturall History is worthy high esteeme, it is full of rarities and true Philosophy. Sir* Hugh Plats *Adams art revived is of good report; I never yet could gaine the sight of it, though Mr* Gabrell Plats *discovery of hidden Treasure is very ingenuous, and could'st thou but fathome his corne-setting Engine, and cleare it to thine own & others apprehensions, it would be of excellent use without question: but for the Country Farmer Translated out of French, with some two or three other little bookes, I can finde but little Edification or Addition to our owne English experiences, what other men can finde out of them I know not, but leave to thee to discover, but for the rest, they have been a great and cleare light to our Horizon: Yet among some of them, one thing is worthy reprehension, which is their large observations of*

sea-

seaſon, ſignes and planets, forgetting God the maker of them and bleſſer of all things, as if Seeds, Herbs and Plants were to be ſowed in the Moone or Planets, which ſhould they be obſerved, they had neede produce a double profit, becauſe not halfe of any would be ſow'd or planted: Theſe times have let in ſo much light as will diſcover the vanity hereof. But I muſt not forget Mr Samuell Hartlips *peeces lately put forth as diſcoveries made to him of great advancements other Countries have made unto themſelves thereby, both which in ſome particulars are naturall & ſuitable, and experimentall in this Nation, and of great advantage, and merit high eſteeme from all, and in other particulars I know not but why moſt of them alſo may be ſo applyed and experimented too, as to raiſe a good, commendable, and profitable advantage if they fall into the hands of ingenious husbandry. I have therefore endeavored to make my thoughts as legible as I can concerning them, as well as all other the aforeſaid to ſo good purpoſe as I ſhould, yet to provoke the more Ingenious to correct them to their owne advantage, although*

though I shall rendering selfe subject to various oppinions, and though doggs barke I passe not, if the Ingenuous Reader will not condemne me before hearing, my designe shall not bee to contend against former mistakes: New discoveries will admitt some of them; but I shall perswade all men to a through triall of what they finde most probably advantageous unto them: And what by my selfe shall be here held fourth are most of them experimented to thy hand at my owne proper cost and charge without the assistance of any other purse or person, & so visible that thy own eyes shall be thy Judges, and the rest shall be so clearely held fourth by irrefragable demonstration and evident conviction of the places where, and the persons by whom as thou needst not scruple; it is time the world is full of conceits and phantasies, nor can my selfe challenge immunity therefrom; yea Reason it selfe hath neere beguiled me till Experience hath concluded the question: And there is a naughty generation of men that have brought an ill report upon Injenuity through their pretences of great abilities in Engineereship, and great experience

of

of raiſing and drawing water, floating lands, oyling corne, adviſing ſtrange compoſitions for Seed and Land, pretending great advantages by Chmiſtry, yet have or could not bring forth the fruit of their great undertakings, ſome through want of meanes to accompliſh their worke, not wiſely forecaſting at firſt what it would coſt, others indigent in their principles, having ſeene or done ſome thing, therefore thought they could doe all things; and others through a baſe ſpirit of deceit, and may bee ſome for want of Patience to try the iſſue: all which have brought a ſcandall upon Ingenuity. Though I verily beleeve much may bee done by many of the aforeſaid meanes, and more will be diſcovered by unthought of waies, many men having ſo good inventions, and very able to adviſe great things for the Commonwealths advantage, yet may not bee able of themſelves to bring forth the ſame to publique experience; ſuch may and doe deſerve ſome publique incouragement, A baſe privacy of Spirit hath ſo tainted us that few can vouchſafe publique ſervice any publique honour, nor publique Inſtruments, a publique recom-

pence: Yet still looke thou out to duty, charge not Ingenuity as an innovation, but act vigorously in thy station; good husbandry is as the sinnewes and marrow that holds together the joynts of common good; all workemanship without Invention resolves it selfe into the workemans belly, for though a new world hath beene of late discovered, yet there is not an occupation or trade of finding them, nor are our English people very active in searching after them; Study Improvements, which though they may not be said to bee either Father or Mother to Plenty, yet it is the Midwife that facilitates the birth. See what shiftings people make for livelihood, how many severall callings doe men make, and yet unmake the maine: The exercising these projections accompanied with a blessing (if I may so call them without offence) will open a way to the reliefe of thousands. The Commonwealth is low, and misery and penury will follow if we doe not rouze the slnggard, and post after Industry, pursue all advantages of Improvement whatsoever: It is a great argument to quicken mee to the more speedy publication of

this

this third Edition, and the reſt of the new additions to it, and though I here hold forth moſt of my owne Experiences, and may bee ſaid to be a Trumpeter of my owne praiſe, yet if thou wilt but conſider, Firſt, that many of theſe particulars have beene wrote as particular Rules or inſtructions to private friends, as my owne experiences, & to alter them will make ſo great an alteration in the whole, as my preſent occaſions will not ſuffer. And Secondly, becauſe I finde ſo great abuſe by ſome mens high affirmations, proving but conjectures, as hath brought Ingenuity under the ſcandall of projects and new deviſes, which men will ſcorne to deeme them ſo when they are made experiments. And thirdly becauſe the ſubject though poore and plaine to be diſcourſed, and great proofe made thereof to good perfection, yet when thou commeſt to the thorow practiſe thereof, thou ſhalt finde it ſo ambiguous, as notwithſtanding, all my alluſions to my own experience will be little enough, and then thou wilt excuſe me. And could the Authour have beene thus ſupplied, it is great odds whether this Peece had rendered it ſelfe unto the haz-

ward of acceptance or disgrace in so rude a manner; I should have added much more, but that the Epistle might have swelled into a Volume, & therfore chose rather to divide what I had to have spoke to the particular rankes of men whom it most concernes, & so have distributed to each a portion as I conceived most sutable to worke their spirits into a flexiblenesse of practice and acceptance, which if they set unto experimenting, I hope they will raise such fruit thereby, as to witnesse to, or be Credentialls of my Frontispeece.

Although I indeavour so mainely to worke my Improvements out of the Belly of the Earth, yet am I neither of the Diggers minde, nor shall I imitate their practice, for though the poore are or ought to have advantage upon the Commons, yet I question whether they as a Society gathered together from all parts of the Nation could claime a right to any particular Common: And for their practice, if there be not thousands of places more capeable of Improvement than theirs, and that by many easier waies, and to far greater advantages, I will lay downe the Bucklers: Nor shall I countenance

tenance the Levell Principles of Parity or Equally, which they seeme to urge from the beginning, till I see the heads of Families and Tribes, Judges and Governours, Lords and Princes of whole Countries, blotted out of the first or succeeding generations, unles they bring us to the New Jerusalem, or bring it down to us, when wee shall not neede to trouble our selves about greater or lesser, or any distinction of person, places, or estates any more, but this Parity is all I indeavour, to make the poor rich, and the rich richer, and all to live of the labour of their owne hands. And thus clearely demonstrating what I have premised, I hold my selfe disobliged in all my promises, except in this, which will be fitter to be presented in a Volume of it selfe, after some good proofe given to the world of thy Industry in Improving thy Lands, viz. Some speciall directions when thy Lands are improved, how to use them or stock them to the best advantage of the Common-wealth and thy profit, and therein shall indeavour these five or sixe particulars. First, to hold forth the best way or meanes of breeding or rearing all sorts of cattle, sheepe, beasts,

or Horſe. Secondly, to ſhew the way of Cow-keeping, Dayrying, or raiſing moſt Cheeſe and Butter. And thirdly, the waies of Grazing and feeding all ſorts of Cattell; All which are three ſtaple Advantages of the Nation, and will hold hands with Tillage, Corning, Trade, and Merchandize; and ſhall add, Fourthly, how to raiſe a great advantage out of Goates and Conneys, for your harder ſtocking Lands, and ſome two or three more particulars, that thou mayeſt not bee wanting in the uſage of thy land as well as in the Improvement of it, and it ſhall ſtrive exceedingly to diſmyſtery them all; and in the fift and laſt place ſhall proportion all with the moſt ſuitableneſſe I can to thoſe ſeverall lands by which they may advance the higheſt profit and greateſt increaſe, and all as largely and plainely diſcovered, as I am able. By a wellwiſher

Of Proſperity to each ſelf, which is

the Common Wealth,

Whoſe faithfull ſervant is

WALTER BLITH.

To the Right Honorable the Nobility and Gentry of the Nation.

Most Noble Sirs,

I Shall take boldneſs to preſent this Rude Epiſtle to your Honours, which indeed need be rather matter of Lamentation of the ſad abuſes many great men doe unto their Eſtates and Families, than exhortation or inſtruction, which I hope ſhall not attend the wiſeſt, though it will the wickedeſt, yet may be a word in ſeaſon, being they are great Impediments; ſome of you lay in way of your own advantage, which being removed how far you'll lie to great Improvements, I ſhall onely here informe you that you are highly capable of being the Common-wealths Advantagers by advancing your own Eſtates. Mr. Fuller *deſcribing the good Land-lord, ſaith, He indeavours ſo to let his Land that the Tenant with ſtock and induſtry may raiſe an honeſt lively-hood, and pay his Rent freely, he deſires not ſo to Rent him as to gall him,*

but

but to quicken him, to put mettall to his industry. The standing Rate he setteth his Lands by, is according to the rise and fall of all Commodities in the Country. And though I doe perswade by all honest meanes to the best Improvement your Lands are possible to be raised to by husbandry, yet shall not advise to such an improvement of your lands (being of Fullers minde) as too many make the onely Improvement, which is by racking up your Tennants to the most rate any man will give, or some their necessity compell them to accept, because that cannot be a Market Price, Nor is a certain or a Righteous rule, And to raise the Market is the greatest Scandall: And though some men to supply their present need, or others to satisfie their Will, or straighten their Neighbours conveniency, will give more than Land is worth as is most usuall, yet when their necessity and end is supplyed, and their will accomplished, or themselves wasted, Your Lands will be turned upon you with such disparagement, as that you must abate more than formerly you extorted, or keep your Lands your selves to your great discredit: Nor shall I advise you to advance your Estate by depopulation, the sad Experiences we have had of former oppressions, and Gods apparent Curse following through divers generations is a sufficient dehortation. Nor shall I incourage any person though never so great in a droniſh idle humor either, your selves as well as we the meanest were made for use, and Members of the Body, and are not priviledged from a Calling neither; And though wee as leggs or feet doe help to bear you, Yet you as braines or eyes must help to steer us right

right: As for that ranting, roring Garb, which too many of the Gentry of the Nation, and some of the Nobles too maintaine, most know the evill thereof, that whilst men maintain the greatest roring, their Estates steal away with most Privacie, God did not raise, nor your Fathers leave great Estates for that end, to consume themselves and that together: God and Nature both abhor it, and themselves will wofully confess it when it is too late. I took none but for Stewards or Tenants for life at best, and am sure a strict accompt will be required as well as how they have used, so how they have improved their Talents. They cannot stop the mouthes of men nor conscience neither to charge their wants or breaches upon Hospitality (which had that been wisely ordered, would have been your glory) God hath annexed a blessing so sure thereto, that it shall be no mans ruine, no its not so much the meat as Sauce, nor great company as want of good, nor so much large dyet expended, as the drink and wine abused, and gaming after supper, night and secret works of darkness draw on a most certain State consumption, and so add but hereunto Idleness, and ill or no husbandry, and so goes all to rack and Ruine. All which waies are Enemies to a sure Improvement (I speak not as a Divine, Morality will tell you) and are none of those I shall prescribe as suitable to your greatest advantage. And now give me leave most honnrable, but to expostulate this case with some of you a little, what gallant parts some lose for want of exercise, what pretious time some abuse that cannot be redeemed, what great Estates

doth some one consume that would maintain thousands, and other suffer to lie ill husbandryed and unimproved that would supply all the needs and wants of this our Nation. I had hoped a gentile birth had been innobled by the most generous Qualities, and that it had been the greatest Grace to the best descents to have been of the highest deserts. But fearing I may offend the honest Landlord with such plain dealing, shall say no more thereof, only unto & of some Tenants shall say, Where the Landlord sets at easie rates and great bargaines to the Tenant, whether through lasinesse, improvidence, or what ill husbandry I know not, seldom thrives thereon, yea many there are that cannot live thereon, nor upon their own free Land neither, whose improvidence puts them upon great straits, and such new experiences too sometimes found out after straihts, that afterward they can live better upon a valuable rent than they could upon their own before, so that the Landlord to set his Lands proportionably to every mans industry or thrift upon them, or answerable to every mans improvidence or decay, he should be more at randum for a rule, than ever he was before. One saith well, that Land is a good First, but Learning is a better Second, and I am of his opinion too, yet say there is a better Third, which is but the drawing forth the fruites of both to the Commonwealths advantage. Therefore that you may Improve to your best advantage, and be right and ever honorable, be perswaded to study Activity in your places, Ingenuity upon your Estates, in these is as great a Splendor as in the most sparkling Diamond, Improve

prove all your Lands to the highest pitch by husbandry experiences, by your selves or Servants. The Earth is your treasure, in whose bowells are mines of wealth; exercise and suffer all waies of Improvement upon your Lands which are very numerous, draw them to the deepest staple, and there you may easily keep them, but let them not be drawn beyond it. If thou hast ingenious Tenants, give them incouragement and assistance in inprovements, or reward for it, you sharing in the profit of it, as cannot be avoyded. Study how in grazing to make Land continue long both fresh and fruitfull, and at last to be the fittest for corning, and in, with, & after corning so to leave it as to make it fittest for grazing. I know wee have some gallant Instruments, members, yea pillars of this Common-waalth, as active and ingenious in this Island as of any Nation under Heaven, God and man both praise them, but they are very few, certainly we are, (compared to some, or what wee ought to be) a very slothfull Nation, yet under great Improvements are most great Estates in England, *and were Ingenuity all a-mode, or in as good request as is some wicked lust or Vanity, we might equallize the richest Nation, and your great losses and large payments might be soon recovered, which that it may, and how it may, this simple Treatise will discover, which holds forth so many waies of Improvement, as that no great Estate in England though never so well Improved (as some are highly) but it shall have a Portion here, and will fall under more advantages than you are aware off, here being some such waies held forth, as was not as yet ever pub-*

lished. Let me beseech you that your high Birth or breeding prevent not your faithfulness to your Country and calling, at least your Spirits of publique Industry, whereby you may be Serviceable to the whole, in being serviceable to your selves and Families, least women shun you, yea Princes Daughters of old that fed their Flocks in Midian. *And if you will but hear one word more of Scripture, Counsell, &c. First seek his Kingdom, and build his house, and hee will build yours, you shall be taught so to manage all inferiour externall things, as through the Blessing abundance cannot be denied, so long as the Promise holds, The thoughts of the Diligent bring abundance, Most honorable I have no other end in this my unbred plainess saving a deep affection to merit unto my self your honours opinion of faithfullness unto, and Covetous of your intire prosperity, though by some not thought worthy to be named.*

Your Honours
Servant

WALTER BLITH.

To

To the Honorable Society of the houses of Court and Universities.

TO you the Gallantry of the Nation in whom is all Learning as one Grand Science with such an homogeneall body that all parts thereof mutually communicate strength and lustre each to other, whose parts and Principles are Ingenuity in the Abstract, and though I shall not hereby perswade you from your sublimer Notions, yet shall by way of Recreation onely pray you step a little into the field and Country, and cast away an hour or two upon this Subject at your leisure, and though I may somewhat depreave your worth, yet I must say, and say it by experience, that you of all men are fittest to make the compleat Improver, and otherwise it cannot be, if generalls include particulars, that you that have the Theorick may easiest discover the Mysteries in the Practick, and from you have I found most incouragement to this work, and seen most experiences of good husbandry than from any, and from you too I expect and waite for more discoveries of some thing I scarce know what to name it, which lies yet in obscurity, but I will

call it the Improvement of the Improver. Onely let me acquaint you, that as there are many gallant Common-wealths men of your Societies, from whom I ſhall rather ſeek protection than give Inſtruction, yet let me to ſome others of you, whoſe eſtates may be are no leſs capable (though they unwiling to ſpend themſelves upon Improvements) ſay thus much, thoſe capacities you and they are under of advancing the whole body in the advancing your particular Eſtates and Families, you cannot know of courſe, nor will it offer it ſelf unto you. This very Nation might be made the paradiſe of the World, if we can but bring ingenuity into faſhion, & if you pleaſe to take the paines of a Serious peruſall of all this rudeneſs, poſſible ſome of you may be a little edified in your condition, and inabled to aſſiſt the work too, both with convenient ſupplies of new principles, more naturall language, and a better Method. And I the rather preſs you to a more ſerious conſideration of what I have here preſented, not onely becauſe you are beſt able to mannage the work unto perfection, but becauſe I conceive ſome of you may now, and I hope more will have a little the more leiſure to improve thoſe great opportunities of improvement you are under, if we can begin now to amend and love one another better, and certainly to many, in the want of a better, this may make a gentleman an honeſt calling. It was a calling honourable enough, however it hath loſt it, and uſefull it is, and as neceſſary

ceſſary as ever it was, and will continue. I ſhall ſay little more to you, becauſe I know your wiſdomes can improve what concernes your ſelves in duty or advantage, for here I write to you as Societies of Learning and Gallantry, but as you degenerate into corruption of Principles or manners, though you have them as either you are Noble or Gentile at ſecond hand, more largely ſcanned in the former Epiſtles, be pleaſed to accept your ſhare therein, as if it had been here inſerted. I know not but why the Engliſh man may vie with Dutchmen. Wee are the Elder brethren, and have naturally as many advantages; though nature hath made the Netherlands younger Brethren, allotting them little land with great hazards, yet ſuch Opportunities that by Ingenuity they cloth themſelves with greateſt treaſure, and though their glory is great in trade and Merchandiſe, yet may they boaſt that what commodities their Country wants they ſo graft by art as to enjoy them in *Re* though not in *Specie*: Our niceneſs in not nurſing the fruits of our own bowells hath given them the opportunitiy to Improve our native commodities to the advance of their Manufacturidge to our ſhame, their praiſe, through meanes of pure Induſtry and Activity: yet having not wholly loſt our birth-right, lets take up in time, nothing hinders but our dulneſs, exceſs, and vanity, Englands wits, principles, and opportunities will out-Vie them, for the belly we may outſtrip them, and for the back wee

may

may equallize them, Nature hath done it for us, and for Trade and Merchandiſe we were before them, and why not againe exceed them, I know not, if we would but will it, and reſolve it, ſtudying ingenuity to the higeſt, and practiſe upon it with our chiefeſt induſtry, wee may as eaſily arrive at plenty as they; the narrowneſs of our ſpirits and ſelf intereſts undoe us: I ſpeak to wiſe men whom I would have more publique men, for ſuch is the love unto his Country. And now moſt honoured let me intreat you for the Peoples and your own poſterity ſake, open your bowells to the Nation, put your ſhoulders to the work, greater things remaine and larger Improvements are yet to be diſcovered, and if you'l pleaſe to practiſe any thing upon theſe experiences here diſcovered, will be much my glory, however take advantage of all your own opportunities to Improve them, and with a little ſeriouſneſs find out the nature, cauſes, fruits and effects of what ſhall offer it ſelf unto you, by which you may work out great experience to your ſelves, and great advantage to your Nation. And ſo through the benediction of the wiſe Creator whoſe end was bleſſing the things he made, and the diligence of our hands we may ſweetly enjoy the fruite of our own labour in great complacency.

Honor'd Spirits of
your humbleſt Servant
WALTER BLITH.

TO

To the Honorable the Souldiery of these Nations of *England Scotland* & *Ireland*.

Gent. Commanders or Souldiers.

IT *may be thought strange to direct an Epistle of this nature to you, as conceived by most, least capable of being Instrumentall of advancing the common good in this nature; yet knowing strange things are wrought by contraries, & finding the best husbands (through my observance) among those who have been least conversant therein, have not the least hopes of you; yet from a Principle of charity too, lest that your learning your fingers to fight, and discontinuance of your callings, might disuse your bodies and mindes so from labour, as to discourage you from your callings, have thought fit to let you know, You also may be very capable to doe good service to your present Generation in this designe: And though many say you are more likely to lengthen out the War to prevent* Improvements, *I am of better hope, and sure, that the Armies late progresses; have manifested the contrary yet I shall humbly take the boldness to press your speeding as full an end thereto as you are able, both for your own good, and these Reasons.*

1 *Because of the goodness and welcomness of a Calme after a storme, no less will be a setled peace after so great a War, and a little breathing will recover strength and spirits.*

2 *Because you need not fear want of good Imployment afterward: This piece wil open many doores for that, and I am confident Activity and Ingenuity will much inlarge our*

Quarters, and make this Nation Rehoboth, *and with good husbandry indeed would more comfortably maintain hundreds of thousands more than there are already born, and I hope you will learne to hate* Idleneſs *wholly, as love* Liberty *dearly.*

3 *And laſtly, becauſe your ſelves are intereſted and poſſeſſed of many lands, and thoſe ſuch too as will admit of great* Improvement *with wiſe mannagement, and ſome of them as great as by this diſcourſe is here propoſed; and though you may conceive your late lands deſigned for your pay were highly ſurveied, and to all advantages to raiſe them, yet thoſe advantages of Improvement were not to be conſidered, nor indeed could be diſcovered by them which underſtood them not; nor was any of them purchaſed at any other rate than the preſent value to be then ſet and let to preſent Tenants; which Lands are as full of vaſt Improvements as any Lands in* England: *for all which cauſes I need preſs no more, but in the honor I bear to a Souldiers name, which God himſelf hath honoured by ſtilling himſelf a Man of War, although I take no pleaſure in War, otherwiſe than in ſubmiſſion to Gods will, and the accompliſhment thereof, which is not to be reſiſted or repined at for the ſatisfaction of our inclination to eaſe, peace, or reſt; upon this account or any other, I beſeech you (ſo long as neceſſities command you to it) to preſerve alway a good Conſcience within; for although hopes of Victory without may carry man through great hardſhipps, yet your peace with God reaches up to heaven, and cannot be ſcaled with Ladders, nor undermined with batteries, being founded upon a Rock, nor ſtarved with famine, a good Conſcience being a continuall Feaſt. Mr.* Fuller *in his holy War gives this deſcription of a good ſouldier, That he that is moſt couragious in War, is quiet and painfull in Peace, and comfortably betakes himſelf to his calling: The wielding of the ſword hath not made his Spirit unwieldy for his private Calling*

ling. And I having this opportunity to distribute this mean piece unto the World, thought good to offer a Portion amongst you the Honourable Souldiery, as for Edification how you may turn Improvers too, also humbly to desire your assistance in the work so far as in you lyeth, to remove some grievances and Impediments of the Common-wealthes advantage, largely discovered in the other Epistles, which brevity causes me to omit, and so no more but humbly pray you study how to serve your present generation in extolling Gods glory, endeavoring the Common-good, and in the interim abandon privacy of spirit. Remember Christs Counsell, view the promised Land, and rejoyce to think of that day when your swords shall be turned into Ploughshares, your Speares into pruning-hooks, and Christ only be exalted in the Earth, and you brought back again to sit under your own vines and figtrees, eating the fruit of your own labours, and injoy one another in Peace; which once accomplished, here is cut out work for you, some to till the Lands, and others to feed the Cattell, as from the beginning, so will this be the lasting Improvement. *Then will the God of Peace keep them in perfect Peace, whose mindes are stayed on him, And* Emanuell *will breake in pieces all that gather against him, which is the the Confidence and full Expectance of*

Your quondam brother, fellow-Souldier,
and very Servant

WALTER BLITH.

To the Husbandman, Farmer, or Tenant.

TO you of all others I might ſpare this paines, you the very practitioners, you that trade in Husbandry, of ſome of you I have high things to report, both for your induſtry and activity; and though I am confident all men are thirſty enough after profit and increaſe, yet few ſtudiously induſtrious in this deſigne; though ſome eſteeme it matter of greateſt moment, yet you will not all be found patronizers hereof; there is ſuch a ſcandall & prejudice among many of you againſt new projections, that I ſhall beſeech you to take a loving admonition in two or three particulars. The firſt is an Epidemicall diſeaſe (and little leſſe are the ſucceeding) and it is a great miſchief to your ſelves and the Commonwealth, and that is ſuch an immoderate plowing your land; ſome plow far more then they can Till or Manure, and others all they have in common though never ſo much, others plowing ſo oft and low, that they draw out the very marrow of it, and theſe are the great Impoveriſhers of your gallant old paſture, though fit enough to plow, & might be beſt advanced thereby with moderation, but into both theſe extremes men are ſo apt to run ſo faſt, that I deſire to ſtop their courſe a little, and ſhall make bold to tell them, that when half or one third part of ſo much land as many of you Till, ſhall with that very ſoyl, and half the labour and ſeed ſaved, yeeld you as much corne as all that great quantity ſcramblingly husbanded, that then you are ill husbands; which you will confeſſe if that you will but grant me that which no man will deny, that one Acre purely husbandryed (& what need any be otherwiſe, or any break up more than he is able well to compaſſe) will be as good as two or three in many mens ordinary practice, but in ſome of your whole-ſale husbandmen that plow all before them, foure or five Acres will not ballance one purely husbanded, then judge ſo much land preſerved from impoveriſhment,

ſo

so much seed and cost preserved, and yet as great increase, whether the opposite actors be not enemies to themselves, families, and Common wealth. The second abuse is want of good Tillage, wee lose our hopes exceedingly by this; and herein we must both have respect to season, land, and corne; for good seasons at all times cannot be expected, yet of two evills chuse the least. I am confident better sometimes lose the land, than land, seed, and all your labour, as many doe that out-slip the season: but for prevention, begin earlier; I am confident though it may admitt of some inconveniencies some times, yet at other times it is out of question, but generally both Summer and Winter seed-time carries it away, sure it hath these advantages, that if it prosper not, you may sow it againe, or if the latter part of seed-time at Michaelmas time prove wet, you are well, having sowed before, or the latter part of seed-time in the Spring prove dry, as most oft it doth, you have prevented that, and what is the great danger of growing proud in Winter, that is to mee a vertue, and if in the Spring, it is easily taken downe also; and if thou feareſt weeds, I am of opinion that the stronger and thicker any corne is, it preserves it selfe the best from weeds, but there is a Medium in all things, too thick sowing may be as bad, but this ever observe, that the earlier thou soweſt, the thinner thou maiſt sow thy winter corne, and summer too, if the season be good, and land dry and sound: And secondly, to your land you must have respect too, Land in good tilth, in good heart and sound, in a good season, will out-cast its very marrow, through the Lords blessing expect fruit enough: Men much wrong their corne in not giving their Lands sufficient workmanship, I am not precise in the number of Plowing nor Harrowing, but just so much and no more than preserves the Land from weedes, and best brings the Land into such a composition that your land mould well. I shall not justifie the old Proverbe, here, No balkes no corne, I say not balkes all corne, even cleanly plowing is most commendable & most profitable; to some grain more tillage, to some lesse is required, yet to none no lesse than may both cover well and yeeld good bottome and rooting to the Corne. And thirdly, for your Corne, some graines require more tillage, others lesse; some will better beare a dryer season, some a wetter; some graine more subject to one weed than to another;

ther, ſome graine will doe beſt with two ſummers; and others with one: In all which conſider and adviſe thy ſelf as much as thou canſt of the nature of them all, and make out what experiences thou canſt thy ſelfe, and ſomewhat incline to the moſt ingenious uſage and cuſtome of thy Countrey. In ſome caſes a good cuſtome is inſtructive; but I'le bee brief here, that I may be a little larger elſewhere following. The fourth and laſt abuſe is a callumniating and depraving every new Invention; of this moſt culpable are your mouldy old leavened husbandmen, who themſelves and their forefathers have been accuſtomed to ſuch a courſe of husbandry as they will practiſe, and no other, their reſolution is ſo fixed, no iſſues or events whatſoever ſhall change them, if their neighbour hath as much corne of one Acre as they of two upon the ſame land, or if another plow the ſame land for ſtrength and nature, with two horſes and one man, as well as he, and have as good corne, he hath been uſed with four horſe & two men, yet ſo he will continue: Or if an Improvement be diſcovered to him and all his neighbours; he'l oppoſe it and degrade it; What forſooth ſaith he, who taught you more wit than your forefathers, would they have neglected ſo great advantage if there had been any? they kept good hoſpitality, and made ſhift to breed up many children, &c. and I know not what ſimple chaff to blinde themſelves; this proud unteachable ſpirit an ingenious man abhorrs, which banes and poyſons the very plenty of our Nation. Theſe prejudices both upon your mindes and practices which boult you out from wealth and glory, my dear friends and fellow husbandmen, I pray you lay aſide, and doe but in charity walk with me a little through this diſcourſe, and I ſhall hope to ſatisfie that there is no other end but common good propoſed, The poore, thy poſterity, and all Intereſt advantage here intended by him that is as ſtudious of thine, the Common wealths Improvement, as his owne.

W. B.

The Epistle to the Cottager, Labourer, or, meanest Commoner.

THIS Treatise somewhat concernes the interest and advantage too, one maine designe I have is to discredit oppression, and prevent it as far as I am able, as well as to Indeavour the advancememt of all interests, I hope Ihave here opened a door for more facile and readier approach unto profits, if you will be studious and active in doing your duty, and will but cast off prejudice till thy Experience hath resolved the question; and if thou take offence at Enclosure for fear of want of Corne or Imployment, thou maist but inquire into the Incloſed Countries of Essex, Kent, Middlesex, Surrey, &c. and see if there be not far more of both than ever, and would in all other incloſed Countries whatsoever, if those Lands were used as here directed, or else up unto the best advantage? or else peruse the severall Answers made to what objection I believe your heart can raise, and then thou wilt be satisfied, or if thou feareſt what may become of thee or thy right hereafter, because great men are apt to eate out the poor and forget their promises and ingagments and settle something now upon you, yet they will take it from you and yours hereafter; to this I shall onely say, I am confident as a due you desire nothing but what is due, and that may as well be setled for eternity as for time, so far it belongeth to thee, and cannnot be taken away; and truly if it be any thing thou desireſt upon curteſie thou must be content with thy portion

portion, and thankfully accept of any kindnes, and if (the Commonwealth being bettered) and thou not worsened by thy alteration, thou art not justly caused to complain, but if your Estate be made better in value than it was, and so continue, as it may by any just or wise Incloſure, Praise God for amendment; Or if thou takest offence at new deviſes or other waies held forth, that neither you nor your forefathers never saw, that need not trouble you neither, you are at your liberty to use or refuse them, and art but desired to try thy experience of them, or not to hinder others that can make benefit by them. I know you will be so ingenuous (being satisfied that though some have undertaken great things and performed nothing, yet, some have effected wonderfull things, by small meanes, far more than they have promised) rather set upon advancing of thy little, being easier, and may be more fully Improved than more, than to be so sottish as a price being put into thy hand, not to have a heart to use it: that be far from thee, there is so much of man in every Child as to imitate what ever is most manly, much more in you to imitate and prosecute what ever may make for your profit or advantage, and if Improvements be not worth thy imitation, yet I am sure they will make work for the poor labourer, and if you will peruse what doth precede or else succeed in this discourse, you may be fully satisfied in all. So shall I say no more at present, but wish thee Gods blessing with thy portion, who have cause rather to praise God than repine at so good a providence, and become all things to all men that I may convince some

That my indeavours are much thy satisfaction, but more thy profit, and my self a common Servant

W. B.

To the Book.

GO tell the VVorld of Wealth that's got with ease,
Of certain profit (gain most men doth please)
Of Lands Improvement to a Treble worth ,
A Five, a Tenfold Plenty's here held forth ;
The greedy Land-Lord may himself suffise ,
The toyling Tenant to Estate may rise ,
The poor may be enricht, England supply'd
For twice so many People to provide ;
Though this a Paradox may seem to you ,
Experience and Reason proves it true ;
By floating Dry, and purging Boggy Land ,
The Plough old Pasture betters to your hand ;
Directions to Incloſe, to all mens gain ,
Minerals found out, Land rich'd with little pain ;
Woods ordred so, in few yeares yeeld such store ,
So large, so good, as you'l desire no more.
In fine, all Land in each Capacity ,
In which it lies, made Pleasant to your eye.

P. W.

To the Author.

THe way is new my friend thou seem'st to go ;
We should incourage Art; But thou must know
Thou't meet with Criticks, and backbiting foes ;
Bad men the best of Workes will still oppose :
If but what only pleaseth all mens sight
Should come abroad, no VVork should come to light ;
Good is made better by Community ,
It's Publique good, to quicken industry :
Thou'st spent thy time, thy Paines, with great Expence
On Countries Good, for Love, not Recompence ;
Let others Read, I'le labour what I can
To imitate this Compleat Husbandman.

A true Friend to thee, as thou to all,
P. W.

To Captain *W. Blith* upon his Improved Improver.

Few, upon search, amongst the multitude
Of human race appear, who are endu'd
With such a Noble Genius, as by Art
Can heighten Nature, Fewer this impart:
For 'tis an Axiom unto most unknown,
That that's the best of good which most is shown;
Vnless some Patents for the same requite
With Publique recompence their private mite.
How then ought all to Count this Author rare!
Who by experience, and observant care,
Know's how to husband grounds to their best use,
And doth to publique light what's known produce!
Who clearly ayms in what he doth unfold
At Common good, still adding new to old.
He gave us heretofore to understand
The Art of floating, and of Watering Land,
Taught us how Fens and Bogs wee ought to drain,
How each one might by fair Enclosure gain,
How antient Pasture might by tillage mend,
Till'd ground by Grazing to improvement tend;
What soyl and compost for each ground is good,
And what waies further best the growth of Wood.
To these this third Edition doth discover
The most approved means to husband Glaver,
The art of planting Liquoriſh describes,

Of

Of Madder, Woad, and Weld for richer dies:
The Planting Cole-ſeed, Flax and Hemp's declar'd,
And how the Ploughs Expences may be ſpar'd.
How of eſpeciall uſe ground may be made
For Gardens and for Orchards, is diſplaid.
Which this Survey of husbandry diſcovers
At Eaſie Rates: but not without endeavaurs;
Improveth Land, to three or five Degrees,
Held forth moſt plain, not kept within skies;
But caſts it all in ſuch a curious mould
To raiſe't from One to ten, yea Twentyfold:
Laſtly the Souldier doth example yield,
How he ſhould Till as well as fight the field,
How Swords ſhould turn to Plough-ſhares, when warres ceaſe,
And what imployment ſuits with times of peace.

Thine upon the pub-
lique ſcore

T.C.

These faults have escaped in the Authors absence, who desires the Reader to take notice of them, and with his Pen to correct them.

In the Epistle to the Councel of State.

PAg. 2. lin. 12. read *on* for *one*. l. 22. r. *wisdoms* f. *wisedoms*. p. 5. l. 1. r. *farms* f. *farmers*. p. 7 l. 14. r. *without* f. *with*. p. 14. l. 12. r. *heave* f. *have*. In the Epist. to the Reader, pag. 1. l. 13. r. *repayration*. f. *repagration* p. 5. l. 23. before *to* put in *though not*. p. 6. l. 1. r. *my self* f. *self*. p. 8 l. 13. r. *l.* f. *it*. In the Epist to the Nobility. p. 1. l. 12. r. *intend* for *attend*. l. 16. r. *fair*. f. *far*. p. 6. r *shame* f. *shun*.

Errors in the body of the Book.

pag. 3. r. *erection* f. *election*. p. 21 . l. 15. r. *tenth* f. *ninth*. p. 35. l. 5. r. *ca.* f. *ac*. p. 38. l. 20. r. *when* f. *where*. p. 39. l. 21. r. *shower* f. *rain*. pag. 49. l. 10 *proportionable* f. *proportiable*. p. 57. l. 13. *to divert* f. *divert*. p. 65. l. 27. r. *second* f. *seacond*. p. 72. l. 27. r. *affec.* f. *affer*. 28. l. r. *horse* f. *house* 73. l. 5. r. *so* f. *no*, *and* for *nor*. l. 29. r. *mend* f. *feed*. p 74. l. 2. r. *overthrowing* f. *ovetbrowing*. l. 9. r. *dashing* f. *dasling*. p. 75. l. 35. r. *beyond* f. *beyoung*. p. 76. l. 12. r. *consider* f. *consinder*. p. 93. l. 30. r. *management* f. *magement*. p. 96. l. 22. r. *worser* f. *best*. p. 97. l. 19. f. *for as the corning land may*. r. *for as to the corning land it may*. l. 13. r. *heart* f. *hurt*. p. 119. l. 17. r. *seldome* f. *feldome*. p. 140. l. 10. r. *sand* f. *land*. p. 147. l. 3. r. *parts* f. *pares*. l. 9. r. *more* f. *your*. l. 10. *and strail* left out. p. 157. l. 30. *eleventh* f. *eventh*. p. 161. l. 14. r. *every* f *ever*. 162. l. 30. r. *graze* f. *grass*. p. 163. l. ult. r. 30 f. 300. p. 165. l. 9. r. *though* f. *thought*. 168. l. 28. r. *root* f. *toot*. p. 169. l. 14. r. *as* f. *at*. p. 170. l. 37. r. *fastest* f. *fasted*. p. 172. l. 10. r. *acceptance* f. *exceptance*. p. 177. l. 4. dele *and the*. p. 181. l. 10. r. *early* f. *yearly*. p. 194. l. 32. r. *need* f. *near*. p. 196. l. 32. r. *therefore* f *herefore*. p. 201. f. 15. r. *it is* f. *is*. p. 210. l. 15. r. *shame* f *shamen*. p. 212. l. ult. r. *considerable* f. *considerable*. p. 217. l. 6. r. *rout* f. *root*. p. 219. l. 7. r. *bonds* f. *boults*. p. 225. l. 21. r. *woaded* f. *woad-red*. p. 231. l. 19. r. *brains* f. *barns* p. 233. l. 26. r. *broad* f. *board*. p. 253. l. 5. r. *clusters* for *cushers*. l. 11. dele *in*. p. 339. l. 7. *other* f. *also*. p. 246. l. 32. after 5 l. r. *an Acre*.

The

The severall waies of Improvement, or Advancement, of the Lands of this Nation: many whereof are undiscovered, and most of them little practised, which being experienced, would be the Common-wealths glory, and a patterne to other Nations.

FOr the discovery whereof (by Gods leave) some particulars shall bee laid downe as generalls to bee discovered. And that I may speake to the understanding of all men, especially those who have little or nothing at all considered of such things, nor so much as ever suffered the practique part of Husbandry to come into their mindes; or those who in respect of their more noble and high imployments have lived and conversed in another Region, about the weighty affaires of the Nation, onely receiving & living upon the present profits of their Lands, not minding their Lands advance; And some few others who have lived more above the creature, and conversed much in heaven, and so are more unacquainted with

the language & tearmes of Husbandry: therfore I will deliver my selfe in our own naturall Country Language, and in our ordinary & usuall home-spun tearmes, especially because I can speake no other, & in as few words as I can possibly conceive it cleare to each apprehension; and therefore before I begin to enter the discourse at large, give me leave to premise the Excellency, Necessity, and Usefulnesse of Improvement, or good husbandry; And then the discourse shall follow under these two generall heads:

1. First, I will discover the causes of Barrennesse upon all Land, and what corruptions both in the Land it selfe, and in mens opinions, practices, and customes, must be removed.

2. The second generall, being the Remedies and Preventions of the said Barrennesse, and the meanes of reducing some to its utmost former Fruitfulnesse, and Improving others to the greatest advantage it is capeable of; wherein that great Improvement promised is held forth at large. All which will be discoursed under

Six Severall Heads or Peeces of Improvement which are made good,

1 BY floting or watering all sorts of Lands which lie under that capacity.

2 By drayning or reducing of Boggy, Fenny, Sea or drowned Lands to firmenesse and fruitfulnesse.

3 Shall be by such a way of Enclosure of common Fields, Heaths, Mores, or Forrests, as shall admit of no depopulation, nor prejudice to any particular interest whosoever.

4 Shall be by such a way of Ploughing or comeing some old Pasture Land, already spoyled for want thereof, as shall much better it, and by so pastureing others, already destroyed by ploughing, as to recover it: and divers other waies to improve your lands to a great advantage.

5 Shall bee a discovery of such simples or Materialls as Soyle compounded with the Earth, with the nature and use of

of both, ſo as thereby you ſhall raiſe ſo much more Corne unto this Nation as ſhall make good the Improvement promiſed.

6 By a new Election or Plantation of divers ſorts of Woods and Timber, as in few yeares a man man make ſufficient buildings thereof; yea upon divers ſorts of Land in this Nation, at twenty yeares growth it will ariſe unto an incredible height and bigneſſe, yea as faſt againe as it naturally groweth.

CHAP. I.

Treateth of the Excellency, Neceſſity, and Uſefulneſſe of Improvement, and good Husbandry.

WHich appeareth partly by the Antiquity of it; for every thing is the more excellent, the more ancient, and nearer it comes to God, the firſt being of all things, which as all things neareſt the Center move more ſtrougly, ſo all Excellency appeares moſt evidently, the nearer (if I may ſpeak with reverence) to that great Majeſty, the great Husbandman, God himſelfe. Firſt in his making the world, hee made all Creatures, and all Plants, Fruits, Trees, Herbs, and all bearing Seed, for the foode of Man and Beaſt; He alſo made thoſe more excellent and glorious Ceatures, as the Light, the Day, & Night, the Firmament, the Earth, and Seas, the Sun, Moone, and Starres, all to be ſerviceable, and miniſters unto the Creatures reliefe, and all the Creatures ſubſervient to Man, & Man to Husbandize the fruits of the Earth, and dreſſe, and keepe them for the uſe of the whole Creation. Excellency, Neceſſity, Antiquity.

So God was the Originall, and firſt Husbandman, the paterne of all Husbandry, and firſt projector of that great deſigne, to bring that old Maſſe and Chaos of confuſion unto ſo vaſt an Improvement, as all the world admires, and ſubſiſts from. And having given man ſuch a Paterne both for

precept and president for his incouragement, he makes him Lord of all untill the fall; And after that God intending the preservation of what he made, notwithstanding the great curse upon *Adam*, *Eve*, and Serpent, the Earth not going free, but a curse of Barrennesse cast upon it also, yet *Adam* is sent forth to till the Earth, and improve it, *In the sweat of his face he must eat bread untill he returne to the Earth againe.*

Gen. 4. 2. And so downe to *Cain* and *Abel*, the one Husbanding the Earth for Tillage, and the other the Sheepe in Passturing,

Gen. 9. 16. and Grazing; and so downe to *Noah*, he began to be an Husbandman; and to *Abraham*, and to *Iacob* and *Esau*, and so along still till they came to Government by Kings, where *Uz-*

2 Chr. 26. 11. *ziah* his commendation was he loved *be loved husbandry*, and many excellent things, as if Husbandry were the most excellent, as indeed it is here on Earth; else aske *Solomon* the wisest, the second Husbandman or Improver of the world, and you shall finde, how out of the depth of his experiences, he cryes up diligence and activity in good Husbandry, therefore sendeth us to the *Pismire*, cryeth down the *Sluggard*, and

Prov. 6. 6. *Sloathful, on whom commeth poverty as an armed man*, and extols
Prov. 15. 19. the diligent as fittest to *converse with Kings*, whose very
Prov. 20. 30. thoughts bring aboundance, even of the diligent whose
Prov. 22. 21. hand and heart are best to beare rule, when the idle shall be
Prov. 12. 20. under Tribute. But to multiply more Scripture, where all experience holds it so cleare, is but to prove a principle ungaine-said; ile say no more. But for the usefulnesse of it, it's no lesse than the maintenance of our Lives, Estates, this Common-wealth, and world, and the Improvement, or Advancement of the fruits and profits of the Earth by ingenuity, is little lesse than an additition of a new world; for what is gained hereby either above the naturall fruitfulnesse of the Earth, or else by reducement of that which is destroyed, or impoverished from his naturall fruitfulnesse, to greater fertillity, is a cleere Augmentation or Addition to the Common-wealth.

All other callings proceeding hence, the Earth being the very wombe that beares all, and the Mother that must nourish and maintaine all. The Merchant is a gallant servant

to

to the State, he fetches it from farre, and tis a gallant Inrichment to this Nation, but he purchaſeth it from others, who could make good profit of it, if he buy it not, raiſeth it not out of nothing, but parts with good Silver or Gold, or ſome good commodity for it, and is a great Common-Wealths advantage.

But this Merchant of Husbandry, he raiſeth it out of the Earth which otherwiſe would yeeld little, unleſſe this ingenuity fetch it out, poſſibly never diſcovered to be there. And what parts he with? or at what rates purchaſeth he it at? *Even only with the wages of the labouring man, whom he is bound both by the Law of God, Nature, and the Land, to maintaine, who may be were he not maintained in worke would coſt as much to be maintained idly. Oh! the Excellency, Antiquity, and Uſefulneſſe, of it. Improve the firſt and chiefeſt of thy Spirits on God in ommifying him above all, and in all, and the reſt of thy wits and ſtrength to ſerve thy ſtation herein, accompting it the ſecond thing neceſſary, a bleſſing being upon the head of him that tilleth Corne, and the thoughts of the diligent bring abundance.* And ſo I proceed to the occaſions of the Earths Barrenneſſe, being the firſt Generall of my diſcourſe. Prov. 11. 26 Prov. 21. 5.

Firſt Generall Head

CHAP. II.

Sheweth forth the cauſes of Barrenneſſe upon all Lands.

THey are uſually two. Cauſes of Barrenneſſe.

1 In Man himſelfe.

2 In the Land it ſelfe.

1 In Man himſelfe it was occaſionally, who by his ſinne procured a curſe upon the Land, even Barrenneſſe it

it selfe, which by the sweat of his browes must be reduced, if he will eat bread, and so now is.

1 Cause of Barrennesse is ignorance occasioning prejudice.

2 In man naturally, which is the maine and capitall cause of all, and is in him as I conceive the Cause of Causes, which is Ignorance, occasioning the prejudice men beare against Improvement, especially that which is not of their owne devising, as all men naturally hate the true light of God, because it discovers their darkenesse, and is contrary to their light, which is that of Nature and Reason onely, the great enemies of Gospell Light. So that parallel hereunto in some measure, is the hatred that many beare to any new Ingenuous discovery of that which is not under their ken or common practice, unlesse they can make it their owne contrivement, which ariseth from old *Adams* proud nature so rooted in ours, that wherein we cannot ascribe unto our selves the praise, we had rather lose the profit, and so presently decry the same, Saying, This is no other but a principle of some young Brainsick, or of one that would Monopolize more to his ten, twenty, or thirty yeares study and experience, than our fathers and fore-fathers attained in all their practices; or else some giddy head that will say more in halfe an houres discourse, than he will make good proofe of in an Age; or else it it is an Experiment that will cost more than the profits thereof will countervaile; or else the Improvement is so great that they cannot possibly credit such Impossibilities, with innumerable more such passages; never putting forth their Mindes, Hands, or Purses, to never so great and profitable and advantage, like the Sluggard, who will not plough, but saith, *A Lion is in the way.* And so, by feeding upon these or such like Prejudices, they suffocate their own unspeakable advantage, which they might accomplish with setting on the worke, and exercising a little patience in waiting for a through triall. Although Ile say it should be our rejoycing when any discovery is made, (chiefly of God) & then of that which shall concerne the publique good, be the instrument what he will, and not ingaged therein for meere advantage onely, as too many have done, holding forth specious Pretences of great wonders, and the

Prov. 4. 13.
Prov. 26. 13.

condition

condition hath ever been great gaine to the diſcoverer, and more than the worth of the diſcovery many times hath been; yet if the naked end be the Publick good, be the diſcovery what it will, or the Diſcoverer conceived neither of ſo deepe a head, nor of ſo long experience, as others have been, yea, though thou conceive it a Project ſo chargeable, that will not anſwer the coſt beſtowed, or an advance ſo great as is not credible, yet conſider if hee utter Reaſon, Art, or honeſty, and eſpecially where he offereth experience for the proofe thereof, have thou patience to conſider thereof, if thou wilt not make triall of it, his is the paines, and if to any, it is thy Gaines, he hath but his labour for his travell.

The ſecond Hindrance as in reſpect of the owner, or occupier thereof, is Idleneſſe, Improvidence, & a ſlaviſh Cuſtome of ſome old forme, or way of Husbandry, exerciſed therein ever ſince they were borne, which begets ſo much the ill Husbandry of theſe dayes, never affecting Ingenuity in any particulars of their Husbandry, which is contrary to the minde and will of God in making us, and the end wherefore we were made, Good-husbandry commanded, and ſo experimented by God himſelfe, and charged on us therein, and ſo commended by *Solomon* the wiſeſt of men, with Ingenuity and Activity, to the putting out the utmoſt of our ſpirits, in ſubordination to our ſpirituall calling, in our particular callings to ſerve our generations, and improve our Principles for the common good, which two aforeſaid cauſes if they be not removed, will never admit of the removall of the ſubſequent cauſes.

2. Cauſe is Improvidence and a ſlaviſh cuſtome.

A third particular cauſe in man of the Earths unfruitfulneſſe, is want of ſevere puniſhment of Idleneſſe, the Mother, and Drunkenneſſe, the Daughter, or the putting in execution of ſuch good and wholſome Lawes as both God and man have provided therein; As alſo not raiſing ſtocks in all Countries, as a Magazine or treaſury of worke, and labour, for thoſe that want it; And thoſe other Lawes for puniſhing of Rogues, and Vagrants, that wander the Country, and compelling and conſtraining youth, and idle people, to ſome callings, All which would both put them on to more Ingenuity,

3. Cauſe is want of puniſhment of Idleneſſe, and want of Stock to ſet the poore on worke.

genuity, and the Gentry, and Yeomanry of the Nation would be much induced to Invention, and Expatiating themselves in charge and treasure, to maintaine them, wherby these horrid sinnes of Idlenesse, Lust, and Lacivioufnesse would be checked, and those Drones, and Caterpillars, the bane of a Christian State, and shame of a Christian Nation, would not so swarme amongst us. It is a crying sin of our Nation, I pray God charge it not upon us, lest as we have already smarted for it, wee smart not now at last to purpose. So that were but these Improvements put into Experiments, their great plea would be silenced (*viz*) *Will you set us on worke? we will worke if you'l provide it? &c.* (and out of all question) the capacities of the Nation herein, are farre more than here be labouring men to act them: and so as they conceive, they justifie their Abomination, both by necessity and authority.

A crying sin,

Drunkennesse.

As for Drunkennesse the Daughter, which so aboundeth every where, that I verily believe, and feare not to make it forth, by reason, and experience, that were it the Daughter, with Idlenesse the Mother, suppressed in this Nation, wee need never to feare want or penury. I know divers Townes in this land, where you shall have two, or three poor Alehouses, wickedly, and wastefully, devoure more Mault, than all the Freeholders, Labourers, and Inhabitants besides. And judge you, Labouring Country people for the most part brew their owne Beere also, neither is there any passage, or Roade-way through the Townes, where these private houses of resort are, and yet these to vent so much Beere, or Ale, is wonderfull! How much then is consumed in great Passages, common Roades, great Townes, Markets, or Cities, wastefully and wickedly, if so much be in Corners remote, and not thought of? so that were there a suppression hereof, how would Idlenesse be abashed? men would scarce stand idle in open wayes, or passages for shame, wife and children enjoy their Fathers, and Husbands at home, if doing little, yet not consuming that they have got already, and the Markets more full, and plentifull of corne so miserably wasted; And therefore as I highly commend these Lawes

we

we have already, and prayſe God for them, ſo I humbly pray a quickning of their execution, wherein our Worthies, had they not ſo heavie preſſures upon their ſhoulders, as are ready to breake their backs, (I am ſure they have broke the ſpirits already of divers, whoſe loſſe we have cauſe to lament with watery eyes) they might humbly be implored for ſome Inlivening, Quickning, Lawes, with ſuch ſtrict penalties annexed to the Execution of them, as the Diſcoverer or Projector might not onely be rewarded, but commended and protected from diſgrace and calumny.

The ſecond generall cauſe of Barrenneſſe is in the Earth it ſelfe, and the principall cauſes of her Barrenneſſe are very many, ſome are obvious to the Judgement, and underſtanding of all, as tilling Land till it beare no corn. A generall cauſe of Barrenneſſe.

And mowing Ground till it Graze no more, or yeeld no graſſe; all which are eaſily to bee remedied if men would learne moderation. Tilling.

But my deſigne lyes not ſo much in Reproving, as Improving and diſcovering that there are many cauſes which lie more obſcure, and are either not diſcerned at all, or elſe not adjudged any cauſe of Barrenneſſe, or hinderance of the Earth her fertility, and ſo not at all endeavoured to be removed; and they are in ſome Lands, extreme Coldneſs of nature, having a moiſt ſpringing water lying near, or juſt under the ſurface or ſuperficies of the Earth, which doth either eat away or devoure the Sap, Fruit, and Strength of the ſaid Lands, or elſe breed and increaſe the Ruſh, and Flagg, which groweth in the roome of Graſſe, and eateth away the ſame.

Another cauſe is Rockineſſe, Stoneineſſe, and Gravelli-neſſe, all which many times lie ſo near the ſurface of the Land, that they devoure much of the Earth, and ſo make that little left ſo weak, that it can ſcarce bring forth any fruit. Rockineſſe

Another cauſe is lying Mountainous, ſometimes ſo neare the Sea, that the Vapors and Fogs, that come from thence, anoy the ſame. Alſo lying far from the Sun and in ſhady parts occaſioneth Barrenneſſe. Mountainous.

Improvidence laying downe all Lands.

Another cause of Barrenness is the unsuitable, unnaturall laying down of Land to Graze, a cause scarce imagined so to be; or the present ill lying of Land, that hath layen long, and was ancient Inclosure, all which are infinitely more prejudiciall to the fertility thereof than can be imagined, till contrary experience hath discovered it: (*viz.*) For that Land that is sandy, warme, or gravelly, that to be laid on high Ridge or Furrow is directly contrary to the naturall fruitfulnesse of that Land; And that which is of a cold, moist, spewing or weeping nature, for that to be laid down flat or levell, is to the ruin and destruction of that also, and is an extreme on the other hand.

How to lay downe watme Land.

How cold Land.

The latter sort requireth high ridged Lands, and cleare open Furrowes; And the first sort the contrary, and especially all lands whatsoever to be laid downe in good heart and strength.

Standing water in winter.

Also another cause is the standing of the winter water upon the land, or the raine of Heaven; I say not the running over lands, so that it may bee laid dry at pleasure, but the standing, soaking water breedes the Rush and fowlenesse, and likewise gnawes out the heart and strength of it, like the worme at the Stomack, and devoureth the strength of it, as experience will shew in many parts of the Land, where great Balkes betwixt Lands, Hades, Meares, or Divisions betwixt Land and Land are left, and one Furlong butting, or Hadlanding, upon other Furlongs, makes such a stoppage of the free passage of the water, that a great part of that Land lyeth as it were drowned a great part of the yeare, that it overcomes not that backing many times till neere Midsummer, when other sound Lands have yeelded a full halfe yeares profit, and so for halfe a yeere yeelds little or no profit at all.

Mole-hils.

Another great prejudice is the Mole-hills, and the Ant-hills, although I shall not directly argue hence Barrenness naturally, yet accidentally they much barrenize it, therefore I shall demonstrate the evill of both; for the Mole-hills that destroyes some part of the Land, by the severall casting up of much mould upon the Grasse, all which are hinderances very great to the increase of the owner. But for the Ant-

hills

hills, if my opinion faile not exceedingly, they are grand enemies to the Grazier, and Husbandmans advantage, they deſtroy more than men obſerve, I do believe that in ſome great Paſtures in *England*, there is one fourth part of the cleare fruit of that Land, loſt by the multiplicity of them, and little better in other paſtures by the Molehills: for although ſome are of opinion that the Ant-hills are little or no prejudice, they are much miſtaken, and they will clearely bee convinced thereof, if they will but either ſeriouſly conſider the quantity of graſſe that groweth upon them, or elſe conſider the rareneſſe of Cattle feeding upon them, and then alſo conſider the quantity of Ground, and good Ground, they cover, wil eaſily appeare the greate prejudice by them. And that the ſand and gravell waſhed from the Mole-hill, is a great cauſeof rotting Sheepe I abſolutely affirme.

But thereto ſome may object, they make more ground. *Ob.*

I Anſwer, they doe, ſuch as it is; deſtroy a leſſer good quantity of Land, and adde poſſibly a double bad: but let them conſider that this Addition is a great Subſtraction; for if you weigh what I ſaid before, they beare little, or no graſſe, a little wild Time, and ſpeary harſh graſſe, that cattell eate not, but a little thereof in caſe of hunget; And I am ſure they cover a great deale of good Land. Doe but really conſider it upon experience made upon one Acre, and thou ſhalt finde that one Acre plaine or bancked ſhall doe as much ſervice, as an Acre and neare an halfe ſhall doe that is ſo hilly; And againe, if you doe not flatter your ſelves, in your owne judgements, you will finde that while the Land was plaine, if you conſider the fruit it then yeelded, and the Cattle it then maintained, you will finde there is no proportion between what it then kept, and what it now maintaines, for in my experience I finde that old reſty Land, much overrun with theſe hills, much degenerates, and doth not, nor hath of late yeares kept the former uſuall Stocke it kept before it grew ſo hilly, and ſo old, by neere or about one fourth part, which I am ſure is as much or more advantage, or cleare profit, the Grazier, Breeder, or Tenant neede expect; and although ſome will not acknowledge their experience here- *Anſ.*

in, yet many I am ſure they finde it by loſing proof, beſides the danger of caſting their Cattle and Sheepe betwixt the Hills which oft deſtroyes them.

Boggineſſe

Another cauſe of Barrenneſſe is Boggineſſe or Miereneſſe, which turnes all Lands both bad, good and better, into ſuch a ſtate of Barrenneſſe and unfruitfulneſſe, that it in ſome parts almoſt deſtroyes the Land, and in other parts it wholly deſtroyes it, and in ſome places makes it worſe than nothing; for in ſtead of yeelding ſome fruit, it not onely yeeldeth none, but corrupts and prejudiceth other Lands on which it borders, and it ſelfe moſt dangerous to miſchieve the Goods or Chattell that doe paſture upon the ſame, and ſo may be accidentally many degrees worſe than nothing.

Conſtant reſting of the water on that Land.

Another cauſe of Barrenneſſe is the Overflowing, and conſtant abiding or reſting of the waters of the Sea, Fenns, Rivers, ſtanding Lakes or Pooles, for be it freſh or ſalt water, if it lye conſtantly upon it, it aſſuredly deſtroyeth it, although ſome more, ſome leſſe, according to the deepneſſe, and barrenneſſe of the water which covers it, and the ſoundneſſe of the ground on which it lyeeh, ſo is the fruitfulneſſe more or leſſe perſpicuous. Some pretend ſtrange cauſes which my plaineneſſe fathomes not, nor much affects our Country Farmers now.

Yet one more I muſt not paſſe by, and that is ſuch New Inventions for the improving of Land diſcovered by ſom young Husband-man at experiences as I conceive the uſe whereof will rather deſtroy Land, and waſt a mans profits thereupon, than advance: and ſome ſuch I have lately found in a little booke called *New Inventions for the Improving lands, Printed for* J. S. *and ſold at the ſigne of the Ball on Adling-hill,* 1646. By which I fearing ſome willing to lay out themſelves in Husbandry experience ſhould be beguiled by his ſo great overtures of Advantage, I ſhall only ſpeake to two or three particulars, and leave the reſt to thy leiſure to conſider of.

Firſt, As to his manuring Plough, manuring Wagon, manuering Stone, Corroding Harrow, or Corroding Rakes, which he pretends as Improvements, ſo far as my ſhallow Principles will compaſſe, are likely to prove Impoveriſhers, becauſe

becauſe while a man ſtands to dreſſe his Land with fine mould, in which is a little ſtrength, his Land decayes for want of good ſoyle or ranck muck, which he may ſooner lay on, & work into his Land by the old way, than he may his fine earth by his new deviſed myſticall Inſtruments, not one of them diſcovered neither; but puzzle thy ſelfe thou mayſt about the thoughts thereof, and though thou giveſt twice as much for the booke as it is worth, for ſo thou muſt, thou art but where thou waſt at firſt: And for his Seed-Barrow, could he but hold that forth to ſet Corne as he pretends, it might be of ſome good uſe, becauſe certainely ſetting Corne, could it be done with ſpeed, and at a certaine depth, and well covered, would be worth diſcovering, but of this I have as little hope and as low an eſteeme as of his other aforeſaid Inſtruments, becauſe he holds it out to containe one Tunnell only for his Seede, which did it containe a hundred would more likely prove, for in ſetting one ſeede at once, no Engine can come neere the hand-ſetting as I conceive; And this I charge as a great prejudice, and may be as a barrenning the land, while men ſtand looking for great things, they neglect their ordinary and old way of Husbandry, far better.

Another cauſe of Barrenneſſe which this Gentleman puts as a means of Improvement is the ſetting up or banking into a mans land the Raine water, or cold Spring water, and then trampling in dung by carting and cattell, as he ſaith, will raiſe and increaſe mire and dirt; and ſo it will, I muſt confeſſe, but what that mire and dirt is worth, I know not: the dung would be excellent good of it ſelf, but what it will be in this courſe of husbandry, I not only much queſtion, but affirme that in all my experience, that treading, poching, and hololing land in winter, was an exceeding great hinderance to Corn or Graſſe that Spring; nay ſome Land I have known ſo poched by Cattels treading, though fothered upon the ſame, both in *Kent* and *Eſſex*, and many other parts, that it hath not recovered of divers years: And what ſtrength or vertue cold ſpring water, or raine water hath to fatten any land, I know not, but wonder then how we have any barren land in *England*: And to make good his Aſſertion, he ap-

peales to them that floate Land by Rivers, whose practice clean confutes his opinion, who study to draine their Land as fast as float it; and the best and most skilfull of them will drown none at all, unlesse for a day or two, but draine as fast, and draw off as fast as they bring it on: And to prove his Tenent, he affirmes how advantageous it will be in keeping up the flouds by his imbankments to secure the Fens from drowning, which is as likely as to keep the Sea from flowing after ebbing; for he that will make banks to keep in Land-flouds, may as well make a hedge to keep in the Cuckow; and whereas hee pretends hereby to raise new Springs, that may be; sure I am he will raise new Quick-sands, and what good use they are of, I am yet to learne. And for Barren Land which he seems so well skilled in the Improvement, which he desires to purchase, I will help him to enough, if he will either be pleased to returne a mild answer if my plainesse have offended him, or else practically make good what hee hath affirmed; for that a man doth doe, is far more credible than that he affirmes he can doe. Many other causes of offences might be spoken unto, but they are referred to a more proper Opportunity, wherein they may receive a more suitable capacity of removall, and will be dropped into the discourse at large, as occasion most seasonably is administred. And so I proceed to the Recoveries of the said Barrennesse. But before I descend to the particulars, consider the severall sorts of Lands, that will admit of Improvement, *Which I consider under two Generall Heads.*

1 Head. First, all Inclosed, Severall Land, whether Meadow or Pasture.

2 Head. Secondly, Common Lands, whether Arable or Grazing. First, Severall inclosed Lands I divide into three sorts, or else will rank them under three Heads.

1 First shall be our worst sort of Lands of what nature soever they be, from the value of one shilling *per* Acre, to Ten shillings; The Improvement whereof will fall under most of the six particular Pieces, it being capable of most and greatest *Improvement.*

2 Second-

2 Secondly, is our middle ſorts of Lands, from the value of Ten ſhillings *per* Acre, unto Twenty, which falls naturally under the third Piece or way of Improvement, yet is capable oft times to fall under ſome or moſt of the other Pieces alſo.

3 Third ſhall be our richeſt Land, from Twenty ſhillings *per* Acre, to Forty, and from Forty to three or foure Pounds an Acre, ſome of this ſort will admit of very little or no Improvement, having all Naturall, and Artificiall Experiments already made upon it, but ſome others of this richer ſort will admit of a very conſiderable Improvement, and is principally diſcovered under the fixt Piece; neither can I ſay that all Lands without exception of the two former ſorts may be Improved: For poſſibly, and out of queſtion very much is Improved already, and others may lie ſo voyd of any capacity of Improvemement, that either there may be none at all, or elſe none that will raiſe ſuch Improvements, as will well and ſufficiently requite the charge and coſt beſtowed; but comparatively not much of this in *England*.

And my deſign is principally to hold onely forth poſſibilities of Improving at a far inferiour charge to the coſt beſtowed, and the Improvement made from ſuch materialls, as generally are loſt, or little or no whit practiſed in moſt parts of the Land. Only improve upon great advantage

The ſecond Generall are our common Lands, whether errable, conſtantly under Tillage, ſuch as are our common fields, all the fieldon or field Land throughout the Nation, of which there may be three ſorts alſo, Bad, Better, Beſt of all, and all and every part thereof may be very much and manifoldly advanced, under ſome or all of the aforeſaid Pieces; or elſe whether it be Commons or Commune of Paſtures upon thoſe great and vaſt Commons, called Heaths, Forreſts, Moores, Marſhes, Meades, or whatſoever of them, Thoſe alſo may admit of a very great Advancement, and theſe Lands will fall familiarly under every Piece, according to their ſeverall values, and capacities, but moſt eſpecially under the third and fourth Piece, treating of Tillage, and Incloſure. And then I ſhall proceed to ſhew you the nature of

of each sorts of Lands whereby the Remedies will be most facile and easie in the application. And so I have ended the first Generall.

The second Generall Head holds forth the severall meanes of Cure: Or the reducement of Land unto Fruitfulnesse and Fertility, discovered under the first Piece of Improvement *of floating or watering Lands.*

CHAP. III.

Shewes the first Cure or Remedy against Barrennesse, and therein discourseth what Lands are most suitable to watering: And how to gaine watering upon the same.

BUt before I discourse the same at large, I shall only say that there are severall Remedies against the said Barrennesse, or divers meanes of reducing these Lands to their naturall fruitfulnesse, or to the Improvement of them to a more Supernaturall Advance than they were ever known to be.

To which I must premonish the Reader, that here lyeth all the Skill and Kernell, which being made forth in some good measure, I hope will give thee such satisfaction that thou

thou wilt not onely vouchſafe me the reading and thy credit thereto, but alſo be a practitioner therein; Which done with delight, will not onely produce the reall advantage here diſcovered, but far greater: For theſe things are, and may be brought to a greater height of Advancement, by how much the more Ingenuity and Activity is exerciſed in the Proſecution and Experimenting of them, and to a greater diſcovery by a conſtant familiar uſe of them, which is the true and reall end of his Diſcovery; and the Proverb herein beſt will hold; *The more the Merrier.*

The Cure follows now more largly.

ALl ſorts of Lands, of what nature or quality ſoever they be, under what Climate ſoever, of what conſtitution or condition ſoever, of what face or character ſoever they be (unleſs it be ſuch as Naturally participates of ſo much fatneſſe, which Artificially it may be raiſed unto) will admit of a very large Improvement. Yet the fatteſt Land was, hath been, or may be bettered by good husbandry.

And ſuch are the Lands, that lye near unto, or bordering upon any River, or ſmall Brookes, your little Rivers, and Rivulets, admiting of greater falls and deſcents than your bigger Rivers do, which run more dull and ſlow, more dead and levell, whereby little Opportunity will be gained of bringing but little Land to ſo great advance by them, but where the greater Rivers can be gained over any Lands, there will the Improvement be the greateſt, and the Lands made the richeſt, the greater Rivers being uſually the fruitfulleſt, having more Land-floods fall into them; But under your leſſer Brookes may your greateſt quantities of Land be gained, and your water moſt eaſily and with ſmall charge be brought over greater parcels than upon greater Rivers.

Under great Rivers will be the beſt Land.

And under leſſer the greater quantities and greateſt Improvement.

1 For the diſcovering of ſuch Lands as lie under this Capacity, you muſt ſeriouſly conſider the Situation of your Lands; If your Lands be a little hilly, and your Brooks run more ſwiftly, more Lands may be brought under them: Alſo if your Lands lye more ſhelving or deſcending towards

the River, or any low descent whatever, that your water may fall off as fast as it commeth on, the quicker and easier will your Land be Improved, especially if your Land be sound, light or gravelly: This is a most gallant opportunity, let your Lands be what they will, or of what nature soever, if it lye descending, the advance will be great enough, if you have either a constant Streame, or Land-flood.

And here let me (good Reader) advertise thee of one Piece of husbandry, most highly commended of most men; And truly so it is very commendable, and excellent, compar'd either with those that use none, or else neglect this where it may be done, which is this.

Setting water on Pooles or Lakes not so excellent.

Many Gentlemen have assayed to water their Lands, by setting the Water in Pooles, Ponds, or Lakes upon them, and continuing it standing, and soaking many daies and weeks together; yea some practise it although their Lands have layen descending; and then draw their Sluces, or remove their stoppages, and draine away all their water again; to which way of flowing, I incourage all men rather than neglect all, and honour them therein; yet if they please to make Experiment of the succeeding way of floating, they will easily let this fall; The excellency whereof consists in the speedy taking away the Water, as soone as it is brought on; And onely suffer it to run over, and so with all speede run off into some drayning Trench againe: The Method whereof shall at large be handled, by which, such a concealed Advantage will bee discovered, that men will wonder how they were so easily deceived. Wherein I shall be somewhat larger, because able men much differ both in their opinions of both wayes of watering, as also in their manner of working the same.

In what Cases to cover Land by Water.

My advise shall be, never cover thy Land with a standing Water, unlesse for a day or two, or else in case thy Land should be so Levell that it hath no descent at all, then better set the Water upon it, than neglect it, so thou be sure to draine it after one or two dayes standing, and then bring it on againe, and take it off againe, as aforesayd, yet it is impossible ever to produce the like effect, as it shall according to the

the ſubſequent directions; Becauſe it neither receives the full fruit, or fatneſſe of the water ſo fully and kindly, nor is grazable and feedable ſo ſoon, nor yet ſo richly, as in the other kind of working.

2. After thou haſt conſidered the Situation of thy Lands, as aforeſaid, then ſearch, and finde out the loweſt part of thy Lands, and there having found ſuch a Levell or deſcent, as will lay all thy Lands dry again, as thou ſhalt have occaſion to floate them, which draine muſt be wrought ſo deep, as that thou maiſt goe under that corrupt feeding, or ſpringie moyſture, that breeds, and feeds the Ruſh, Flag, and Mare-blabb, or elſe cauſes thy Land to turn Spewing, Moriſh, or boggy, which two Advantages, if thou hadſt diſcovered, and found upon thy Land (which little Land in *England*, but hath one or both of them) come to the third Direction, and,

3. Therein conſider ſeriouſly the nature of thy Land, which if it be cold, and of a ſad Nature, moyſt and ſpewing, and lye very Levell It will require then a very good Land-flood, or a conſtant River to overflow it, and other barren hungry Water will do very little good thereof. Land ſad and moyſt worſt to Improve by watering.

But, if either thy Land be Gravell, or of a ſound, warme, ſandy, or mixed Nature, and any whit Deſcending, then any Running Streame will have a gallant Operation; The warmer, lighter, and ſounder is the Land, the greater is the Advantage. Theſe particulars diſcovered, out of queſtion thou haſt a wonderfull advantage before thee, eſpecially if thou haſt any great length and quantity of Land along the River, or by a great Roade-way ſide, or elſe haſt any good Land-floods from great Townes or Cities, make as much of theſe Advantages, and prize them as thy Lands, for though hereby thou canſt make thy Lands no more, yet thou mayſt make them ſo much better, as thou canſt deſire. Land ſound, dry, and warm the beſt.

Suppoſe ſome man of great credit ſhould ſay, Sir, you have two hundred Acres in ſuch a place, what if I ſhould lay you a hundred more in the midſt of them? hee would wonder at it; yet becauſe of the credit of him that ſpake it, he doth not wholly diſdaine it, and if it could bee done, he

deſerved thanks for it; but he doth doe it really, though not in kind, that advanceth or Improves the Land but one third part, that makes Two Acres as good as Three, much more he that makes One as good as Three, or Five, or Ten, as before this watering buſineſſe be done ſhall clearely appeare; and ſo I deſcend to the working out the ſame. I had forgot another ſort of Land which is your Boggy Quagmiry Land, no leſſe capable of a mighty Improvement if it fall under the opportunity of floating, and ly any whit deſcending.

Boggy Lands good for watering.

CHAP. IV

Shewes how to worke thy Land, and Water, ſo as to reduce it, and worke out the Improvement promiſed.

WHerein a little conſider of the way of both fitting thy Land to thy Water, and thy Water to thy Land, with the trueſt, naturalleſt, and propereſt Seaſons, for bringing it on, and taking it off, and thou ſhalt ſee an admired iſſue.

And being reſolved that thou haſt an opportunity upon thy Lands to make this Improvement out, Plot out thy Land into ſuch a Modell or Platforme as thou mayſt be ſure that all thy Land thou deſigneſt to this Improvement, may not faile therein, I meane that all thy Lands thou reſolveſt to floate may be under the true Levell of thy Water; And that this may be, I ſhall here diſcover to thee how to carry thy Water upon the Levell, that thou ſhalt loſe no ground, neither carry it ſo dead, that thou canſt not kindly worke it, and this preciſely obſerved, may be in ſtead of many Perſian Wheeles, ſo highly commended by Mr, *Gabriel Plats*, which Wheele is alſo commendable, and may be very uſefull, where either no good falls can be gained, nor other waies the water cannot be raiſed to higher parts of ground you deſire to water; The deſcription of which Perſian Wheele I hope to give thee before this diſcourſe be ended, And alſo intend in my

Additions

Additions, if not where I deſcribe and figure out the Perſian Wheele, to diſcover a far better Engine, that ſhall with leſſe ſtrength raiſe a greater quanty of water for any uſe.

And now for the Method or way of working thy Water upon thy Land without this Wheele, which will require a double ſtreame, one to drive it, and another to be raiſed, and without the charge of all other appurtenances to the ſaid Wheele belonging, as Dams, Sluces, &c. and the maintenance of the ſame for preſervation of this charge, and for the more eaſy working the Improvement.

Take a moſt exact Survey of thy Water, not by thy Eye onely, but by, and with a true exact Water Levell, which is an inſtrument though plaine and eaſy, yet rarely made nor uſed among us, which ſhall be largely deſcribed among other Tooles in the ninth Chapter, then either begin at the over end, or neather end of thy Land, which thou pleaſeſt, if at the over end, where the water firſt entreth into thy Land. And by thy Levell diſcover and plot out where thy water will goe along thy Land, as thou goeſt downeward, that ſo thou mayeſt loſe no Land, that will eaſily be brought under thy water; Then cut out thy Maſter Trench or Water-courſe if thou pleaſeſt to ſuch a bigneſſe as may containe all thy Land-floud, eſpecially to bring it within thy Land, and ſo bring downe thy whole Water-courſe together: But the moſt certaineſt way is, as ſoone as thou haſt brought thy Water within thy Land, upon the Superficies of it, then carry it along in a foot broad Trench or leſſer all along thy Levell, which Water will be a great helpe, and a ſecond and truer Levell than the other, and in thy working of it thou ſhalt find all little enough to prevent too dead a Levell, and yet loſe no Ground neither: If thy Levell be too dead, the leſſer ſtreame will follow thee, ſo that a convenient deſcent muſt be minded alſo to give the water a faire and plauſible paſſage or current all along. And if thou diſcover in this leſſer Trench, any miſtake or failing, then thou mayeſt with more eaſe and leſſe charge amend the ſame eaſily by going higher upon thy Land, or lower towards the water, & ſtop up the ſame again (for thy Trench need be no deeper than

How to begin the firſt piece of watering.

the thicknesse of thy over Turffe) and cut out a new, and so thou mayest most certainely demonstrate where thy maine worke shall goe without hazzard, which will be a great certainty, and little losse.

This done thou mayest cut out thy water course, and be sure it be large enough to containe the whole Water thou needest or intendest, and so thou have longitude or length of Ground, the Trench must be the broader not the deeper, for a shallow Trench is best for this worke. And when thou hast brought it so far into thy Land, as thou hast any Land to worke upon, thou mayest a little narrow thy Course, as thou seest the quantity of thy Land, or Water requires, and so far as thou wouldest have thy Course float over all at once, thou must cut thy Trench narrower and narrower all along to the neather end, that so without stops & staies it may flow al along at once, the Trench being narrower & narower, that Water that comes within the Trench when it is wider, must needes be thrust out when the narrower cannot containe it; for here is the true excellency of this sort of Trenches; and thus should all thy floating Trenches be made in every worke.

As soone as thou hast brought thy Water upon thy Land, and turned it over, or upon it, then as aforesaid, be sure thou take it off as speedy as possibly, and so faile not to cut out thy worke, so as unlesse thy Land be very sound, and thy Land-floud very Rich, thou must take it off the sooner by a deep drayning Trench, therfore I prescribe thee no certaine breadth betwixt floating and drayning Trenches, but if thy Land is sounder and Dryer, or lieth more Descending, thou mayest let it run the broader, and as the Land is Moyst, Sad, Rushey and Levell, let it run the lesse breadth or compasse; And for thy drayning Trench it must be made so deepe that it goe to the bottome of the cold spewing moyst water, that feeds the Flagg and Rush; for the wideneesse of it, use thine owne liberty, but be sure to make it so wide as thou mayest goe to the bottome of it, which must be so low as any moysture lyeth, which moysture usually lyeth under the over and second swarth of the Earth, in some Gravell or Sand, or else, where some greater Stones are mixt with Clay, under

How to make the drayning Trench.

under which thou muſt goe halfe one Spades graft deepe at leaſt: Yea ſuppoſe this corruption that feeds and nouriſheth the Ruſh or Flagg ſhould lie a yard or foure foot deepe, to the bottome of it thou muſt goe, if ever thou wilt drayne it to purpoſe, or make the utmoſt advantage of either floating or drayning, without which thy water cannot have its kindly Operation: for though the water fatten naturally, yet ſtill this Coldneſſe and Moyſture lies gnawing within, and not being taken cleane away, it eates out what the Water fattens. And this alſo I muſt deſire thee ſeriouſly to obſerve, that as ſoone as thy Water hath ſpent it ſelfe, and the Earth or Graſſe hath exhauſted and drawne out of the Water her ſtrength and richneſſe, then how long ſoever it runs longer and further, it prejudiceth and corrupts it by breeding the Ruſhes in abundance: The water runing trickling among the Graſſe, and upon the Earth, leaving her Thickneſſe, Soyle or Filth, which I call Richneſſe, among the Graſſe, and upon the Earth, and it ſelfe runneth away into the drayning Trench, and troubles thee no more, and ſo the Goodneſſe of the Water is as it were Ridled, Screened, and Strained out into the Land, and the Leaneſſe ſlideth away from thee, which can never be done, neither ſo ſpeedily, nor ſo purely, by ſtanding on Lakes or Pooles, beſides the loſſe of the Grazing, which may be neare as good in Winter as in Summer, upon a good Land-flood or rich Waters.

Shews how the water is fruitfull.

CHAP.

CHA. V.

Shewes the cauſe of Water its fruitfulneſs, and the proper ſeaſon of watering Lands.

A Rich Land-flood is ever the waſhing down of great Road wayes, Common Fields, under Tillage; or elſe from great Townes, Houſes or Dunghils; The riches whereof is unvaluable. Conſider the goodneſſe of thy Water, if thy Water be a rich Land-flood, or a luſty gallant Streame, it will run further and wider upon thy Land with life and fruitfulneſſe; If leane, thin, and onely from Springs and Herbs, or greenſoard, tis more barren, and ſo will operate upon leſſe Lands, ſo that as I ſaid before, thou muſt well obſerve both Land and Waters ſuitableneſſe, and ſo increaſe the latitude or breadth of thy Land thou intendeſt to improve with that ſtreame, before it fall into his Drain; Which Drain thou muſt dig, or make ſtraight down as it were by a Perpendicular plum-Line, which will draine the beſt of all; Or elſe thou mayſt make thy Draine, or Trench, ſomewhat Taper (*viz*) Narrower and Narrower downewards, which will keepe open the beſt, and continue longeſt, and for the Widneſſe of it, that muſt be reſolved both from the nature of the ground, which if Sound, and Dry, will require the Leſſe, but if Moyſt and Boggy, the Greater and Deeper; Or elſe from the quantity of Water it is to receive, that ſo it may carry it all away plauſibly within it ſelfe, and for the drayning Trench be ſure thou indeavour to carry it as neare upon a ſtraight Line as is poſſible, the Reaſon ſhall afterward appeare: This worke is of more advantage, and more to thy profit than thou imagineſt, but thy exerciſe therein will teach thee more.

Hnw to make the Drayning Trench.

Thou muſt alſo well conſider the proper ſeaſons of the yeare, bringing on thy water, which is in the beginning of Winter,

The beſt floating ſeaſon.

Winter, when Graſſe groweth leaſt, and beginnes to faile, and is cleane eaten off thy Land, all Winter long, is very ſeaſonable for this worke; And the beſt ſeaſon to take it off, is in or about the beginning of *March*, thou mayeſt make what Improvement almoſt thou deſireſt, alſo upon thy moyſt, cold, Land, if thou obſerve the directions given.

Upon moyſt Land.

But for thy warme ſound Land thou mayſt continue thy water, and keepe it working upon thy Land, almoſt all the yeare round, Provided that thou keepe it not too long upon a place, for thou muſt be ſure to have an eſpeciall eye, that thou ſoake not thy Land too much, that Cattell treading, or Grazing upon it, foyle it not, for then the Riſh will come upon thee, and it will over grow thee, and exceedingly prejudice thy hopes, (miſtake me not) I ſpeake not here to adviſe thee to continue thy water thus long upon one place, but be ever removing it from place to place, but eſpecially to ſhew the proper ſeaſons to make uſe of this Piece of Improvement.

Upon warme Land.

Thou haſt alſo another great advantage hereby having water drawne over thy Land, thou art in ſuch a Capacity that in caſe of drought in time of Summer, thou needeſt not to feare it, thou mayſt now and then wet over thy Land in the heat thereof, when Graſſe if it have but Moyſture, will grow far faſter in ſo hot a time than any, but be ſure not to ſoake thy ground too much; Keepe thy Land rather in a thirſting condition, not glutted ready to ſpew it up again, ſo mayſt thou preſerve thy Land greene, and fruitfull, when others are Scorched all away, Then may a weekes Graſſe or a Loade of Hay proſibly be worth, Three, or Foure.

A double Advantage of having a water courſe cut out.

I my ſelfe by theſe opportunities, have cut twenty foure Load in a Meadow, where I cut but five or ſix the yeare before, when Hay ſold at a great value; The directions exactly followed, I will loſe my Credit if thou faile of the effect promiſed.

Preſident of one yeare curing but five or ſix and the next twenty foure

And for thy encouragement, I will give thee a preſident or two: Certaine Acers of light, ſandy Land were taken for a Tearme of one and twenty yeares, at the value of one ſhilling ſix pence *per* Acre, and that was more than it was worth,

Preſident of ſandy Land.

a little Brooke with a Land-flood, iſſuing out of a Common Field, was brought over it, the Land levelled, and made fit and even to receive it, for it was very Irregular, and of great high Ridges and Furrows before (after the manner of that Country) and after two yeares working, thirty ſhillings an Acre would have beene given for it, (I my ſelfe offered it, and ſome of that Land alſo was my owne, but it was refuſed) being wrought juſt by the aforeſaid Directions. I have made the like Improvement my ſelf upon Lands of the ſame nature, to as great advancement as is here ſpoken off, too tedious to diſcourſe. M. *Plats* alſo in his Book, produceth a preſident of Lands, Improved by Water, with the charge of three hundred ſhillings, to be worth three hundred pounds *per annum*, but what it was worth before the three hundred ſhillings were expended upon it, he ſaith not, but no queſtion, very great Improvement, I beleeve it was.

Mr. *Plats* Preſident.

As for Boggy Land alſo, I have recovered ſeverall Pieces next to plaine Quagmires: The meanes of reducing whereof ſhall be diſcourſed by themſelves in the next Chapter: So bad and boggy it was that Cattel could not Graze upon it out of danger; And indeed it bore nothing but Cattayles; And by this courſe I recovered it to perfect ſoundneſſe, and made it worth betwixt Thirty and Forty ſhillings *per* Acre, and ſo dare undertake the like where ever, lying under the aforeſaid Capacities. Many more preſidents of this nature, are viſible in many parts of this Nation, Some as great Improvements as theſe, Some leſſe, and yet very great; And all done without any other Coſt or Expence of charge, in any other materialls than Poore mens labours: Which to me is a ſecond Argument of Incouragement, to promote all workes of this nature under theſe Capacities. One thing more I pray thee obſerve, that though it be the common practice of moſt men in drayning their Land to make many ſhallow Trenches of about one foote deep, and lay their Mould on heapes, that ſo they may ſpoyle but little gound, both which I muſt neceſſarily reprove as ill Husbandry: For though I am all for Floating, and Drayning, which will neceſſarily occaſion many Trenches, yet I am an Enemy to this

Preſident of Boggy Lands.

Too much Trenching is madneſſe.

this ordinary and uſuall way of Trenching; firſt for ſo many Trenches, I conceive no need in theſe workes, nor upon any Land whatſoever, but ſomething more of them, more ſeaſonably in the ſecond Piece of Improvement.

CHAP. VI

Sheweth the true Artificiall making of the Floating Trench, and how to Levell Land, and the ſuddaineſt way to Soarde it.

USually I ſhall adviſe, to make not above Two, or Three materiall Trenches, having firſt taken up thy Turfe, juſt under the Graſſe rootes, both thin and ſquare, and as broad as can be taken up, which I exceedingly prize for many uſes, and preſerve. The one called a Flowing, or Floating Trench, wherein I carry my water: which uſually after I have brought my water where I intend to worke it; I carry it in a Trench ſeldom above one foot deepe, or a foot and halfe, & many times not above eight, or nine inches deepe: that ſo it being made Artificially, (*viz.*) So Level & taper, & Narrower and Narrower, as aforeſaid, the further it goes, that it may ſo caſt out the water, that it may flow over the ſame for a furlongs length al at once, which is the Excellency of it; And then another drayning Trench running parallel with this, or Two if the Land lye very flat, and of ſuch a depth as it may not onely receive all the water that Floweth over the Land clearly, but that it may alſo drayne away the cold Moyſture and Boggineſſe that offends the Lands, by breeding either Ruſh or Bogg, and of ſuch a Latitude, or breadth, from my floating Trench, as thy water is of ſtrength to Improve, without Prejudicing of it, by breeding Ruſh, Flag, or filth, as aforeſaid; And as I make not many Trenches, ſo I ſhall fill up all others that are not ſerviceable to theſe, and ſo have done

There are two ſorts of Trenching.

Manner of making the floating Trench.

done many a one, that others have made to Drayne their Land withall, and with this One or Two Draynes cast out, in the lowest part of my Land, layed dry more Land than a hundred of these common Trenches would, for a thousand Trenches made above the Corruption that feeds the Boggines, or Rushes, never Draynes, or takes away the cause, that the effect cannot possibly cease. As for heaping the Earth, and moyling the ground, that I also conceive may be prevented by maintaining one Horse and Cart, and sometimes a couple of Wheele-Barrowes, or a double Wheele-Barrow with two Wheeles, made big enough for two men to wield, or a little Cart made with two little Wheeles, and another lesser than them by halfe, to bare it at a constant pitch to fill, which may bee so made, that either with two men or a horse you may carry away a great weight with much speed, and shift it horse and man at pleasure, which shall be described at large in the shaddow of it in the Ninth Chapter of Trenching tooles, and into them I cast my Mould, as I digge or cut out my Trench, and so carry it away when I first digge it, either into some old Trench or hollow place, and there lay it, and then take my Turfe, which I tooke up in all my other Trenches, and cover over that Earth, and there will bee as good Soard that yeare, if it be layd before *February* enter, as in many parts of the Field beside; And so shall save both the labour of removing my heaps afterward, and the spoyling of so much Land as they would cover. And for the better carrying on this Improvement by Water, if thy Lands be either Hilly or Banky, or lye high Ridge, or Furrowes, upon which thy water will never work kindly, take a Direction or two for the more easie Levelling of the same (how to levell or plaine Lands for watering most easily, and Artificially) which thou mayst doe either of these two wayes, Either of which I cannot more especially commend unto thee, thine own Experience will demonstrate that.

A shallow Trench doth a certain hurt and uncertaine good.

How to prevent heaping Earth, and in evening the ground.

How to Levell Land.

The first is levelling by the Plow, which thou mayst do by two or three plowings, and gain a Crop also if thou rather affect it, herein thou wert best to begin about the latter end

of

of *September* firſt to plow thy land, which I adviſe to caſt as moſt men doe a Fallow, and then in the beginning of *December*, be ſure to give it a ſecond plowing, juſt overthwart all the lands, and ſo cut the Turfe, that the Soard may have all the Winters froſt to wroxe, and moulder it, which towards *March* thou mayſt plow again, and ſo caſt it, or raiſe it, as thy Land requireth, to bring it moſt even, and levell, and if one more Plowing will not doe it, then thou muſt doe more, and Harrow it alſo, to draw down high places, and fill up Valleyes, and if it yet be too Irregular, and ſome places ſo high, that the Plow and Harrow will not bring them down, thou muſt get ſome Labourers, with their Spades, and take down thoſe places, and caſt them into Regularity: A Labourer with a Spade upon this wrought Land, will doe abundance in a day; but be moſt Exact and curious in Levelling thy Land, it brings more Advantages than thou art aware of, or I have time to ſhew: And then about the middeſt of *April*, ſow thy Lands with ſuch ſeeds as are moſt ſuitable to the nature, and richneſſe of it, but ſow it not too thick by any means, nor too thin neither, but the thinner is thy Corn, the ſtronger will it be, and the more Graſſe will grow among, which will help thee more in the Soarding of it, than hinder thee in the Crop of it, which Crop may pay a conſiderable ſumme towards this Charges; But if thou deſire a more ſpeedy Soarding of it, and haſt no reſpect to the preſent profit nor charge, in reſpect of a ſuddain diſpatch of it, then as before, ſo ſoon as Graſſe begins to ſtand at a ſtay, and grows but a little, plow thy Land a thin broad furrow, exceeding Exact, and true, or rather flay it or take off the Skin or Turffe with a very broad whinged or tuſhed Share, as broad a Furrow as thy Plow will carry; and as ſoon as thou haſt plowed it, cut it all at ſuch length, as thy Turfe may hold taking up, and heap thy Turfe ſpeedily upon the next Land, and then plow thy Land again and caſt it down, and if it lye exceeding high, caſt it twice, and then two men with their Spades will levell any uneven Hill or Ridge moſt eaſily, and thou mayſt either with the Plough or Spade, or both, im-

Plowing to Levell.

Spade to help Levelling.

The ſpeedieſt Soarding of Land.

immediately bring it flat, and purſue the work with all violence, the Turfe being taken up, ſpeed thy levelling with Plough and Spade, that ſo thou mayſt be ſuddenly ready to lay down thy Turfe againe, and then take this Turfe, by all means before the Graſſe be killed, or loſe the colour, or deaded, and lay it downe as thou ploughedſt it up, every Joynt meeting and cloſing as even as thou canſt poſſibly, and expect how much ſoever thou canſt make plaine, and Levell before *February*, thou mayſt reap great Fruit, or a good Crop of Graſſe that Summer, eſpecially if thou haſt Water to Floate it with all, and when thou haſt done One Land, then thou mayſt remove thy Furrowes, or Turfe, to that thou haſt levelled, and worke that Land accordingly as the other, and then Turfe it alſo, and ſo goe forward throughout thy Field one after another.

Levelling Land by the Spade.

Some others have levelled all by the Spade, and by that means they have, or may more certainly mixe their hungry Land, and fat Land more equally, and lay it down all a like hereby, which courſe alſo I very well approve, and if a man have very good Tooles, and Irons made on purpoſe, one to cut out his Turfe, and another to take it up ſquare, and even, as big as it will poſſibly hold to take up, or a man can eaſily raiſe with his naturall ſtrength, which Tooles are hereafter to be diſcourſed in the Tenth Chapter, hee may very near diſpatch as much, as otherwiſe is directed; if the Land bee very uneven. I have had a man hath taken up Turfe all day long near two foot ſquare, if not above, and heaped the ſame, and three other men have followed, and levelled, and he hath alſo layd and planted downe the ſame, as faſt as they could levell it: You cannot poſſibly beleeve how faſt worke will goe forward, with true Artificiall Tooles, made exact to every purpoſe, and how much delight men will have to worke with them. And if thou wilt bee curiouſly Exact indeed, thou mayſt after a Shower, or after thy Land is once ſoaked, or throughly wet thorough, get two or three broad Beaters made of a Plank betwixt two or three Inches thick, fourteene or fifteene Inches long

A preſident what one man hath done at Turffing and Levelling Land.

long, and about nine Inches broad, with a good ſtrong Staile put into, or neare the middeſt of it, with which beat over all thy Land; one luſty Labourer will goe over a great deale of Land, and it will lay it curiouſly and even, and very delightfull to the eye, and ſuitable to the Water working.

And having brought your Land thus levell, then your water will work moſt gallantly, and even, Floating every place Proportionably, which you muſt take eſpeciall care of, and not ſuffer it to runne a whole Streame over ſome, and ſcarce diſcernable over other parts, but be ſure every where a like, and when you have your water over your Land, that it run over it with a conſtant thin Streame, it will Improve faſt enough, for ſoaking water breeds the filth, which you muſt avoyd as the moſt Peſtilent Enemy to this Husbandry.

The

The second Piece of Improvement containes the Drayning, or Reducing of Boggy Lands to sound Pasture, is further discoursed in the Chapters following.

CHAP. VII.

WHerein is to be handled Drayning, or taking away Superfluous and Venomous Water, which lyeth in the Earth, and much occasioneth Bogginesse, Mirinesse, Rushes, Flags, and other filth, and is indeed the chief cause of Barrennesse in any Land of this nature. Something I have already spoken as to Bogginesse, that lyeth under a Capacity to be floated with Water, either River or Land-floods; In the Reducement whereof, you must precisely apply your selfe to all parts of the former Chapter, for bringing your Water upon your Land, and working it also, and taking it off again; Especially that your Drayning-Trench, or Trenches (for possibly in this sort of Land more may be required, according to the nature of the lying of your Land, if Uneven, and full of Dales, and Vallies) be made one Spades graft or pitch below the matter of the Bog, I mean the Spring, for so it is; which must be clearly Drayned; which I cannot too oft reminde you of; But now I only speak to those Lands which are from under such a Capacity of floating with Water; And are only such as are covered with constant Water, and Lakes, or else the Boggy, Miry, Lands it selfe, and have no River, or Land-flood to be brought over them, and the remedies being equally

Applicatory

Applicatory to both for the moſt part, I will propoſe generall remedies. I ſay that Drayning is an excellent, and chiefeſt meanes for their Reducement, and for the depth of ſuch Draynes, I cannot poſſibly bound, becauſe I have not time, and opportunity, to take in all circumſtances, therefore in generall thus:

How to make thy Drayne to drayne a Bog to purpoſe

Be ſure thy Draynes be ſuch, and ſo deep as thou haſt a deſcent in the end thereof to take away all thy water from thy Drayne to the very botom, or elſe it is to no uſe at all; for ſuppoſe thou make thy Drayne as high as an houſe, and canſt not take thy water from it, thy worke is loſt; for look how low ſoever is thy loweſt levell in thy Drayne, thou mayſt drayne thy water ſo low, and not one haires breadth lower will it drayne thy ground then thou haſt a fall or deſcent to take it cleanly from thy Drayne; therefore be eſpecially carefull herein, and then if thou canſt get a low deſcent from thence, carry thy Drayne upon thy Levell untill thou art aſſuredly got under that moyſture, mirineſſe, or water, that either offends thy Bogg, or covers thy Land; and goe one Spades graft deeper by all meanes, or thereabouts, and then thou needeſt not tye thy ſelſe preciſely to a dead Levell, but as thy ground riſeth, or as the moyſtue lyeth higher, ſo maiſt thou riſe alſo, ſo that thou keep one Spades graft as aforeſaid under it; and that thou mayſt not faile herein, obſerve that in Cold Ruſhy Land this moyſture or cold hungry water is found, beneath the firſt and ſecond ſwarth of thy Lands; and then oft-times thou commeſt imediately unto a little Gravill, or Stonineſſe, in which this water is, and ſometimes below theſe in an hungry gravill, and many times this Gravill, or Stoninſſe lyeth lower as aforeſaid; but in Boggy Land it uſually lyeth deeper than in Ruſhy, but to the bottome where the ſpewing Spring lyeth thou muſt goe, and one Spades depth or graft beneath how deepe ſoever it be, if thou wilt drayne thy Land to purpoſe. I am forced to uſe Repitions of ſome things, becauſe of the ſutableneſſe of the things, to which they are applyed; as alſo becauſe of the ſlowneſſe of peoples Apprehenſions of them, as appeares by the non-practiſe of them the

Where water lyeth in Ruſhy Land.

which where ever you ſo drayning and trenching you ſhall rarely finde few or none of them wrought to the bottome.

The matter that feeds the Bog, where that lyeth.

And for the matter or Bogg-maker that is moſt eaſily diſcovered, for ſometimes it lyeth within two foot of the top of the ground, and ſometimes and very uſuall within three or four foot, yet alſo ſome lye farre deeper, ſix, eight, or nine foot, and all theſe are feazable to be wrought, and the Bogg to be diſcovered, but untill thou come paſt the black Earth, or Turfe, which uſually is two or three foote thick, unto another ſort of Earth, and ſometimes to old Wood, and Trees, I meane the proportion and forme thereof, but the nature is turned as ſoft, and tender as the earth it ſelfe, which have layen there no man knows how long, and then to a white Earth many times, like Lime as the Tanner, and white-Tawer, takes out their Lime-pits, and then to a Gravell, or Sand, where the water lyeth, and then one Spades depth clearly under this which is indeed nothing elſe but a ſpring that would faine burſt forth at ſome certaine place, which if it did clearly breake out, and run quick and lively as other Springs doe, thy Bogg would dye, but being held downe by the power and weight of the Earth, that oppoſeth the Spring which boyles and workes up into the Earth, and as it were blowes it up, and filleth the Earth with Winde as I may call it, and makes it ſwell and riſe like a Puf-bal, as ſeldome or never you ſhall finde any Bogg, but it lyeth higher and riſing from the adjacent Land to it, ſo that I beleeve could you poſſibly light of the very place where the Spring naturally lyeth, you need but open that very place to your Quick-ſpring, and give it a cleare vent, and certainly your Bogg would decay, by reaſon whereof it hath ſo corrupted and ſwolne the Earth, as a Dropſie doth the Body; for if you obſerve the Mould it is very light, and hollow, and three foot ſquare thereof is not above the weight of one ſollid foot of naturall Earth, Clay, or Land, whereby I conceive that how much ſoever this Mould is forced from the naturall weight, or hardneſſe of ſollid Earth, or Clay, ſo much it is corrupted, ſwolne, or increaſed

Every Bogg hath moſt certainly a living Spring within it.

ſed, and blowne up, and ſo much it muſt be taken downe, or let forth, before ever it be reduced; I therefore preſcribe this direction, (*viz.*)

Goe to the bottome of the Bog, and there make a Trench in the ſound ground, or elſe in ſome old Ditch, ſo low as thou verily conceiveſt thy ſelfe aſſuredly under the Levell of the Spring or ſpewing water, and then carry up thy Trench into thy Bogg ſtraight through the middle of it, one foot under that Spring, or ſpewing water upon thy Levell, unleſſe it riſe higher, as many times the water or Spring riſeth as the Land riſeth, and ſometimes lyeth very levell unto the very head of thy Bogg, unto which thou muſt carry thy Drayne, or within two or three yards of the very head of it, and then ſtrike another Trench overthwart the very head both wayes, from that middle Trench, as far as thy Bogg goeth, all along to the very end of it, ſtill continuing one foot at leaſt under the ſame, and poſſibly this may worke a ſtrange change in thy ground, of it ſelfe, without any more Trenching.

Shewing how every Drayne muſt be carried up from the loweſt levell.

But for theſe common and many Trenches, oft times crooked too, that men uſually make in their Boggy grounds, ſome one foot, ſome Two, never having reſpect to the cauſe or matter that maketh the Bogg to take that way, I ſay away with them as a great piece of Folly, loſt labour and ſpoyle; which I deſire as well to preſerve the Reader from, as to put him upon any profitabe Experiment: for truly they do far more hurt then good, deſtroy with their Trench and Earth caſt out halfe their Land, danger their Cattell, and when the Trench is old, it ſtoppeth more, then it taketh away, & when it is new as to the deſtroying the Bog it doeth juſt nothing, onely take away a little water, which falles from the heavens and weakens the Bogg nothing at all, and to the end it pretends is of no uſe, for the cauſe thereof lyeth beneath, and under the bottome of all their workes, and ſo remaines as fruitfull to the Bogg as before, and more ſecure from reducement then if nothing was done at all upon it.

Shallow Trench reprehended.

The moſt ſure way to deſtroy a Bogg.

Or thus thou mayſt worke it ſome what a more certaine

way, but more chargable, (*viz.*) After thou haſt brought a Trench to the bottome of the Bog, then cut a good Subſtantiall Trench about thy Bog, I meane according to the form of thy Bog, whether round, ſquare, or long, or three or four yards within thy Boggy ground, for ſo far I do verily beleeve, it will Drayne that which thou leaveſt without thy Trench at the depth aforeſaid, that is underneath the ſpring water round ; And when thou haſt ſo done, make one work or two juſt overthwart it, upwards and downewards, all under the matter of the Bog, as is aforeſaid, and in one years patience through Gods bleſſing, expect thy deſired Iſſue ; and if it be in ſuch a place as will occaſion great danger to thy Cattell, then having wrought thy Works, and Draines as aforeſayd, all upon ſtreight lines, by all means, prevent as many Angles, Crookes, and Turnings as is poſſible, for thoſe will but occaſion ſtoppages of the water, and filling up of Trenches, and loſſe of ground, and much more trouble than otherwiſe. Then thou muſt take good green Faggots, Willow, Alder, Elme, or Thorne, and lay in the bottome of thy works, and then take thy Turfe thou tookeſt up in the top of thy Trench, and Plant upon them with the green Soard down-wards, and then fill up thy workes levell againe, untill thou come to the bottome or neather end of thy work, where thy Trench is ſo ſhallow, that it will not indanger thy Cattell, or rather take great Pibbles ſtones or Flint ſtones, and ſo fill up the bottome of thy Trench about fifteen Inches high, and take thy Turfe and plant it as aforeſaid, being cut very fit for the Trench, as it may joyne cloſe as it is layd down, and then having covered it all over with Earth, and made it even as thy other ground, waite and expect a wonderfull effect through the bleſſing of God, but if thou mayſt without eminent danger leave thy workes open, that is moſt Certaine of all. I might make more particular Application of the premiſes to the drowned and covered parts of the Fens and Marſhes in the next Chapter, upon which they will have ſuch an Operation, as to reduce them to perfect Paſture, and to great profit, and to all ſorts of ſuch natured Lands, thou mayſt apply them, and

The prejudice by crooks and angles in water courſes.

How to make Draynes without any prejudice to any ſheep or beaſt.

The beſt way of preventing danger to Cattell in Drayning.

Fens and Marſhes recovery.

and ſave me much labour, being the maine meanes of Fenne Drayning. As for Sluces, Flood-gates, Waires, and Dams, are but ſecundary meâns, and being the proper work of an Engineere or good Carpenter, I ſhall ſay no more for brevity ſake: But if thou canſt by any meanes make thy ſelf capable of bringing any conſtant Streame or powerfull Land-flood and Water, and conſtantly Flow over the ſame, as in the former Chapter, that will reduce it to a greater Advance, and work the moſt certaineſt deſtruction to the Bog of all, as I have before declared by Experience.

Floting beſt deſtroyes a Bog

As I conceive, the Bogs in many parts of the Nation were occaſioned thus: wherever is a Bog, I am confident was formerly a Spring, which Spring, running and venting it ſelfe, kept the Land round about it, ſound, and dry, as where moſt clear Springs are at this day, but the ſaid Spring ſtopping up, either with leaves or Cattels treading, or wood falling upon the ſame, or other filth (for I beleeve many, or moſt parts of this Land was very woody in former Ages) the Spring was ſtopped that it could not clearly vent, and ſo being a Living water, would not be ſuppreſſed, or buried, but ſwels and boyles up into Boggineſſe, and ſo vents it ſelfe by little and little in a greater Compaſſe of Land, becauſe it cannot break forth clear together in a leſſer, becauſe of the preſſure and weight of the Earth upon it, and this is the moſt naturall cauſe thereof that I can gather; And my Reaſon is this, In many Bogs (I will not ſay in all) I have found great Pieces, or Boughes, or Bodies of Trees lying in the bottome of the Bog Four or Five foot deep, in the full proportion of a Tree, or Bough, as it fell in, but when you come to take it up, you may cut it with your Spade juſt as you doe your Earth, and it goes to Earth, but how this ſhould come ſo low and lye ſo deep, and ſo familiarly in Lands of this nature, and not as frequently upon ſound Lands, I cannot conceive otherwiſe then as aforeſaid.

The probable occaſion or firſt cauſe of Boggineſſe.

CHAP. VIII.

Answereth severall Objections made against the Probabilities of so great Advance by Floating.

Ob. These are but pretences.

IT may be some will still object and say, that these Affirmations are but Pretences, no such Advantage or ease as is promised can possibly be performed.

Ans. 1. But I say again, many Gentlemen can witnesse the truth hereof: Many Lands can shew it, and if thou wilt not beleeve Relation, beleeve thy eyes, go and see; he who prints my Book, shall be inabled to direct thee, where thou mayst see more than here is affirmed.

2. Again in many of the Wood-land parts in this Nation, as in *Worcestershire*, *Warwickshire*, *Staffordshire*, *Shropshire*, and *Wales-ward*, and *North-ward*, there are many more Improvements made upon course lands, than is in other parts upon better Lands, and the Improvements made in the Wood-land-parts, speaks out the truth hereof, much whereof being most Barren of all lands, is Improved so high, as that it is at present as rich as many parts of the Fieldon, and fuller of wealthier Inhabitants, I am confident more rich Farmers of late yeares than when their lands were naturall more Rich and Fertile. I give not all, nor all sorts of Presidents of Improvements I could by far, but onely a few here and there to quicken thy desires after them, the Experimenting whereof will bring more to thee, if not bring thee to them. These things I know of my own knowledge.

Watering breeds the Rush.

Another he objects that it will breed the Rush, the Flag, and Mareblab, and so this floating land shall be more prejudiciall than advantagious.

I anſwer, its true poſſibly, and eaſily it may, as I have ſhewed before, but be thou carefull of my directions, conſider thy Land if it be dry and ſound, and thy water if it be Fat and Ranke, and make the drayning Trench as afore directed, and never feare it, all the Difficulty is in the cold Land, and Barren Water, on which alſo obſerve punctually my Directions, and Ile warrant it; Make thy Draine deep enough, and not too far off thy Floating Courſe, and water it with a good force of water, and obſerve the ſeaſons, which are all the cold of Winter when the Ruſh groweth not, It muſt have warmth to exhale, and draw it out, and be ſure to lay thy Land ſound, and dry by thy Drayning Trench that it may drayne under that Moyſture, Filth, and Venom as aforeſaid that maintaines them, and then beleeve me, or deny Scripture, which I hope thou dareſt not, as *Bildad* unto *Iob*. *Anſ.* Eſpeciall ſeaſon for watering Land.

Can the Ruſh grow without Mire, or the Flag without Water, &c. That Interrogation plainly ſhewes, that the Ruſh cannot grow the water being taken from the root; for it is not the moyſtneſſe upon the ſurface of the Land, for then every ſhewer ſhould encreaſe the Ruſh, but it is that which lieth at the Root, which drained away at bottome, leaves it naked barren of reliefe. But ſuppoſe it ſhould breed ſome few (and the Mareblab too,) which is a ſign thy Land begins to fatten, then take thy whole Streame, or a good conſiderable ſtreame, and bring upon that place, and over flow it, as is afore directed in the Third and Fourth Chapter, in *December* and *January*, if it take them not away I will do it for thee: Floating Land will as certainly deſtroy the Ruſh, the Flag, and Mare-blab (being well drayned againe) as work the leaſt Improvement, and no Land richer than Watered Meades. Iob 8. 12. *Anſ.* 2. A ſigne when Land begins to fatten.

Thou wilt ſay, many men have made great Experiments this way, and done great works, and caſt up all againe; Either the profits would not anſwer the charge, or elſe it would hinder ſome other Lands advance another way, or elſe could not bring their Land to their deſired Improvement, or elſe doe ſo little as was not worth their labour. *Obj.* Many have done great things herein and alway to no purpoſe.

Anſ. I had hoped that I had laid down ſuch undeniable grounds and experiences, as would have removed all thoſe Objections; but ſith they are made, have patience, and I will returne a particular anſwer to each clauſe of the Objection.

1. I ſay, were all this true, as poſſibly it may in ſome men, and in ſome parts, yet be not diſcouraged, becauſe of what I have ſaid, and the Experiences made are alſo obvious; and in the view of them thou ſhalt ſee more advantage made then is here affirmed.

Mountebank Engineers projections.

Myſterious Engines reproved.

2. And ſecondly to confirme thy Objection, I ſay, We had ſome Mountebankes abroad that have held out ſpecious pretences of wonders, as many Engineers have done in drawing Water, or drayning Lead-Mines, Tin, or Cole-Mines, and to that purpoſe have projected Engines with double, treble, and fourfold Motions; conceiving and affirming every Work, or Motion, would multiply the eaſe in raiſing the water, but not conſidering that certainly it muſt multiply the weight and burthen thereof; And alſo put ſuch an Impoſſibility unto Tackles, Geares, and Wheeles for holding, that all would fly in ſunder at the very firſt motion, and continually one thing or other out of order, and ſnap in ſunder as faſt as mended, becauſe of the great ſtrength is required to move the ſame; miſtake me not, I doe not here reprove the uſe of Engine Work, a good Engineere is a gallant and moſt uſefull Inſtrument in a Commonwealth, and they have principles moſt able to make the beſt Huſbonds and Improvers, I onely warn you of Impoſters: Engines are moſt neceſſary, and eaſeth all our burthens, and all our ponderous maſſie ſubſtances are, or may be lightned thereby; and a good Engineere in theſe dayes have taught us the uſefulneſſe of them, little leſſe neceſſary than our very wet bring; but thoſe few Inſtruments here held forth are plaine, and ſimple, and my Projections nothing but Country Experiments, that I fear the plainneſſe of them will be no leſſe offenſive, they being onely to give a moderate eaſe and ſpeed to ſo toyleſome and coſtly labours.

3. I anſwer thirdly, that many have made ſome Experiments,

ments, but thoſe I conceive have neither been full Experiments in all particulars, nor Regular according to the particular directions here given; And ſo may as well ſpoil all, as he that takes all, or moſt of the Ingredients in a Medicine, and applies it to the Diſeaſe preſcribed, but either he miſſeth in the Compoſition, or elſe in the Application; or elſe if he be right in all, he may fail for want of patience to wait the iſſue, but caſts all away as worth nothing, and claps in with another Receit, and ſo is able to give no poſitive reſolution what the effect thereof might be. Therefore I ſay as before I have ſaid, Trace me along in all particulars, and fail in none of them, and if the iſſue fail, challenge the Author as a deceiver.

4. And that I may anſwer the full charge, I ſay, take my counſell for the ſeverall Tools propoſed, and I queſtion not that in moſt ordinary Works, the charges ſhall not be any proportion to the profit. But ſay an Acre of Land ſhould coſt thee forty ſhillings the fitting and preparing of it, as poſſibly ſome may, it may lye ſo irregularly, 'tis then as poſſible in two or three years time, the ſame may be made worth forty ſhillings *per Annum*; yea more, many other Acres thou maiſt work to as good an advantage for twenty ſhillings, ſome for ten ſhillings, ſome for five ſhillings, and ſome leſs; I could give the particular Experiments for them all, were it more neceſſary than brevity, which I ſo much affect, and reſolve.

Object. And for prejudicing other Lands, as many ſtrongly ob- *Anſw.* ject, it is almoſt as if one Hive of Bees ſhould proſper more *Object.* in one Garden than twenty would; the contrary Experience *Anſw.* conſtantly manifeſteth, and ſo I have done with this improvement: And for improving ſo little as is not worth the labour, that is as frivolous alſo. Many ſcore thouſands of Acres in *England* are under this Capacity, and may be reduced to a twenty or thirty fold improvement; yea in ſome parts of the Kingdome, ſome hundreds of Acres together may be wonderfully advanced this way to a proportionable Advantage, and with leſs charge proportionably than a few.

There is also much Boggy and Miry Land that may be reduced to advancement, and such capacity as some may lye under may be improved twenty fold or more. And as for corse Fen and Marsh Lands upon both Fresh and Salt waters, there hath been such gallant notable Atchievements, by many Accurate and Ingenious Spirits, to whom the Nation oweth high Acknowledgments, and whose works and experiments I doe admire and honour, to whom I desire to be a Pupil: Yet notwithstanding their Discoveries, and their Works, cut forth throughout the Nation, and left to Idle Practitioners, and Slothful Impatient Slubberers, who have not onely done it by the halfes, but stifled many a gallant plotted Opportunity of a far greater Advance than it hath produced; And so possibly in many parts of the Nation there may be great Reparations of these Ruines, and a certain Reducement to high Advantage; As also some Addition possibly to their Modell, or some increase to their Beginnings, which is acknowledged far easier than the first Projection, and shall be discoursed at the latter end of this Chapter.

Marsh Lands.

The first Fen-drayners, or Levellers highly to be honoured.

Invention far harder than an Addition to it.

The last way of Improvement of these sorts of Lands, prejudiced by water, is a way appliable to every other sort of Land whatever, which lye under that Opportunity, or Capacity, which is cutting strait the water-courses of little Brooks, and Streams, that run many times in spirall lines, and sometimes circularly, as they would make the figure 8. and so lose as much more excellent Land as need be; nay in some places twice or thrice so much, besides these Angles, Triangles, and almost Squares, and Circles, much endangering Cattell, by goaring, rushing, and thrusting them in, and also makes such stoppages, and oppositions to the water, that hinders the Current of it, and occasioneth it to lye soaking on the Land, that it either breedeth Rush, Flag, or Mareblab: Also the aforesaid directions is a great means of laying sound much Land overcome by Bogginess, the water lying so upon it, that it drowneth or stifleth a great part of the fruitfulness of it, yea, suffocateth and choaketh others also bordering upon it, no small prejudice to the

Cutting water-courses strait no small advantage.

the Nation in general, and too many Townſhips and perſons in particular. A ſtrait water-courſe cut a conſiderable depth in a thouſand parts of this Nation, would be more advantagious than we are aware of, or I will task my ſelf here to diſpute further. And though many perſons are interreſſed therein, and ſome will agree, & others will oppoſe; one Creek lyeth on one ſide of the River, in one Lords Manor, and another lyeth on the other ſide, and divers men own the ſame, why may not one neighbour change with another when both are gainers? If not, why may they not be compelled for their own good, and the Common-wealths advantage? I dare ſay thouſands of Acres of very rich Land may hereby be gained, and poſſibly as many more much amended, that are almoſt deſtroyed; but a Law is wanting herein for preſent, which I hope will be ſupplied if it may appear Advancement to the Publick; for to Private Intereſts it is not poſſible to be the leaſt prejudice, when every man hath benefit, and each man may alſo have an equall allowance if the leaſt prejudiced.

Many thouſands of acres recoverable with little charge to manifold advantage.

But a word or two more, and ſo ſhall conclude this Chapter, and it is a little to further this Improvement through a great deſtruction (as ſome may ſay) it is the removing or deſtroying of all ſuch Mills, and none elſe, as drown and corrupt more Lands than themſelves are worth to the Common-wealth, and they are ſuch as are kept up, or dammed ſo high, as that they boggyfie all the Lands that lye under their Mill-head; ſuch Mills as are of little worth, or are by conſtant great charges maintained, I adviſe to be pulled down; the advance of the Land, when the water is let run his courſe, and not impounded, will be of far greater value many times: But in caſe the Mills ſhould be ſo neceſſary and profitable too, and far more than the Lands they ſpoil, I ſhall then adviſe, that under thy Mill-dam, ſo many yards wide from it as may prevent breaking through, thou make a very deep Trench all along ſo far as thy lands are putrified, and thereinto receive all the iſſuing ſpewing water, and thereby ſtop or cut off the feeding of it upon thy meadow, and carry it away into thy back-water,

Some Mils deſtroy more than they are worth.

To prevent corrupting land by a Mil-dam as much as may be.

ter, or falſe courſe, by as deep a Trench, cut through the moſt low and convenient part of thy Meads: But put caſe thou ſhouldſt have no convenient fall on that ſide thy Mil-dam, then thou muſt make ſome courſe, or plant ſome trough under thy Mill-dam, and ſo carry it under into ſome lower courſe that may preſerve it from ſoaking thy meadows, or paſtures under it, and by this means thou maiſt in a good meaſure reduce thy Land to good ſoundneſs, and probably wholly cure it, and preſerve thy Mill alſo. As for that objection of hindering the grinding of corn, it is very frivolous, for

Firſt there is in many parts ſo many Mills, as hinder one another, and are ſcarce able to live one by another.

2. There are, or may be Wind-mills erected in moſt parts, that may ſupply that want, and are leſs chargeable than Water-mills: And for that ſome ſay the wind is uncertain, I ſay it is ſo certain, that I am confident few or none need want grinding, if they can get corn; for I my ſelf live in a Country where is no other but Wind-mills, and have ſcarce in a twelvemonth known any want of grinding. But ſhould it be ſo, one may be ſupplied by Horſ-mills; one good horſe will grind wheat eaſily, and two good horſes will grind any good dry corn, and are not at that charge for repairs, as both Wind-mills and Water-mills are.

3. I ſay it is poſſible to deviſe a Mill with truth of workmanſhip, and ſome other advantages, that two men may grind any good corn whatſoever, and that as much in an hour as any uſuall Water-mill in the Country; and to this work I ſhall commend one Mr. *Dimock*, a very ingenious Gentleman, and one who hath diſcovered ſo much to the World already, as may give ſufficient teſtimony of the truth of his abilities in this kind.

CHAP.

CHAP. IX.

The Ninth Chapter ſhall be a brief and plain diſcoverie of the moſt Feacible way of Fen-drayning, or regaining drowned Lands, or in bounding of the Sea from it

AS to the Drayning or laying dry the Fenns, thoſe profitable works the Common-wealths glory, let not Curs Snarle, nor dogs bark there at, the unparrelled advantages of the World, give me leave becauſe hitherto all men have Monopoliſed their inventions as they call them, as poſſibly they might lawfully unto themſelves, and the myſtery, and no mans Experiences therein have at all been publiſhed to publique view, which whether it doe ariſe from a privacy of Spirit, ſelf advancement, or rather from an ungratefull frame of men, Governors truſted with the publique Weale of a Nation, or great men well able to recompence publique diſcoveries, whoſe ſhares will be greateſt of the Advantage (which laſt through Charity I am bound, and from ſad Experiences many Ingenious hearts hath found, I doe believe) but no man as I ever yet ſaw or heard, hath publiſhed any thing at all to any ſuch purpoſe as to diſmyſtery the ſame, therefore by the good leave of thy patience I ſhall take boldneſs to pull off the vizor of thoſe apprehenſions I have found therein, and diſcover the open face of that Experience I have made, be it beautifull or deformed; in pitty to move others to cover the deformities thereof, or put more beauty thereon.

In the diſcourſe whereof I ſhall candidly indeavour to draw it into as plain a Map or Platform,

as the roughneſs and confuſedneſs of the work, or my weakneſses will admit; and to that end ſhall confine my ſelf to theſe particulars.

1. What drayning is, and a diſcovery of Fen-lands how they lie to thoſe that know them not.

2. To diſcover ſome of the Rubbs or hinderances that lie in the way of working it to the Common-Wealths advantage.

3. To hold out the Cure or beſt and ſpeedieſt way for the Reducement or recovery thereof to perfect ſoundneſs.

4. To diſcover the beſt and moſt profitableſt way of Improvement of thoſe recovered Lands to the beſt advantage of the Common-Wealth.

In all which I ſhall ſay but little, nor can ſay half that is to be ſaid therein, but to each ſhall ſpeak ſomwhat as near to truth as may be, and leave the Compleatment to ſucceeders.

1. *What Fen-draining or the recovering of Lands from under water is, that deſerves the name or merits the Title of perfect Drayning.*

What Fen-Drayning is not.

I ſay it is not onely the overly taking away the Water from off the Surface or over part of the Turfe or Sword; for then might all boggs or quagmires be recovered, and eaſily would. Nor the taking off the downfalls, as our Fen-men call them, that is the waters falling from the Heavens in great Raines and ſhowers; Nor is it the taking off all Land-falls, Land-floods, or great waters from off thoſe Lands, No nor the doing of all theſe in a cuſtomary and uſuall way that doth or will deſerve to be called a perfect Drayning.

What perfect Drayning is indeed.

But it is as I formerly ſaid about recovering Boggy-Lauds, a going to the bottom of the Corruption, and taking away the Venom that feeds the Fen or Moor, that watrineſs and coldneſs

coldneſs which gnaws out the ſpirit at the root.

And the taking away this, is perfect Drayning; for although I ſay the other Draynings are not the beſt nor perfect, yet I neither diſcommend the other, nor diſcourage from them where they are made already, or may be made hereafter, but highly commend them or any of them where otherwiſe there would be none, or the Lands lie wholly drowned; yet being in all Arts, Trades, and Callings, we ought to ſtudy out the Myſteries thereof, and all men doe or ought to endeavour to raiſe the richeſt fruites, and draw forth the greateſt plenty to the Common-Wealth, they can out of the whole Earth; ſo out of this ſmall parcell we never accompliſh *The End* untill we have brought it to it's beſt perfection, that is not onely to recover it from drowning to bearing ſedge or reedy flaggy graſs, which is the firſt Fruits of Drayning, and from which the rude ignorant Fen-man deſires no appeale, nor is it to recover it to bear moriſh foul ſtrong graſs in Summer and Drowned in Winter, nor yet to lie dry both Winter and Summer upon the Surface of the Earth, and wet and boggy at the ſpades or Plow-ſhare point, nay though it will through a dry ſeaſon or heat of Summer bear the Plow, and much of it may be converted to Tillage or Corning, but ſtill unſound in the bottom, all this makes not (though a good) yet not a perfect work, but the perfection is in the reducing it to ſoundneſs and perfectneſs of Mould and Earth, whether Sand, Clay, Gravell, or mixed; then returns it to a perfect Soard and pure Turf, brings forth the ſmall common Thiſtle, Clover, Crowflower, and Hony-ſukle, then ſhall you reap the Quinteſſence of the Earth, in breeding, feeding or Corning. Theſe Lands thus perfectly Drayned, will return to be the richeſt of all your Lands, and the better Drayned the better Lands. Where are your richeſt Lands of *England*, but your River Lands, your Marſh Lands, that all of them lie under the Levell of the Sea, and were it not inbounded by the banks, and the power of Gods word would all return to the Sea again, but through their perfect Drayning, are moſt excellent ſound and warm Lands, yea ſome of them ſo good, that uſually the Winters profit of their

How to know when Land is firmly Drayned.

their Grazing equallizeth the Summer, as witnesseth much of the Marshe Land near *London*, *Blackwall*, &c. with many other parts? Whence is the richnes of your English Holland Land but from the pure and perfect Drayning? And the out-landish Holland Lands recovered to this great height of Richnes: I know all Lands are not so Fecible as others are, nor some cannot possibly be brought to that perfection as others may, I shall ptovoke unto the best Improvement, and where there can be a Male-Improvement offer not to the Common-Wealth a Female, and so you have as plain a description what Drayning is as I can give you: I am of a strong opinion that there is very much Fen Land may be recovered to as great a worth and goodnes in it self as any Meadow Marsh Land in *England*; which leades me to the second branch of this particular, to describe the Manner and lying of the Fenns, to the which I am induced too for these Reasons.

1. Becaus many know them not at all.

2. Becaus many are discouraged from the thoughts of attempting the Improvement of them, that are very able thereunto, & I am confident would have recovered them, yet partly becaus of their ignorance of the lying of them, conceiving them to be some great Lake, Pan or Meer, as are some in *Lancashire*, *Cheshire*, or *Yorkshire*, that lyeth so low that hath no fall or out-let can be made to Drayn out the Waters of them, and partly through the scandall and offence that is taken and given out, by rude customary, and most an end unrightfull Commoners, against the Draning of them; as also conceiving them to be nothing els but some great Bog or Quagmire lying so flat as is not Draynable.

3. Becaus my self, was once before I knew them in some measure thus deceived, but especially becaus the report of the Country people was as one man, that the undertakers Drayning had no whit at all advantaged them, but that their Fen Lawes and Commission of sewers, and the works they made through that Authority, and by the directions and meanes they used, had brought the Fenns into as good a posture as all the undertakers works, (the which my self was hardly

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drawn to believe) endeavouring hereby to suggest the impossibillity of ever accomplishing a perfect Drayning, so that many not knowing that the fall is considerable in it self, and very great into the Sea by reason of the Ebbing of the Water, will thereby give oportunity unto a most compleat Drayning of them.

And lastly, that by this information I may quicken all Ingenuous Spirits to the helping on the work so advantagious to the Common good, and yet so fecible. I therefore describe the Fens of *England* to lie in some proportiable manner to those great Rivers and gallant Meadows adjoyning to them in many even and less descending Countries, onely with these two observations.

1. That these Fens are nearer the Sea, the Center of the waters, and so we must conceive the fall or descent to be the lesser; for as our lesser brooks run quicker than our great Streams, and the bigger the stream and nearer the Sea any great River runneth, the slower by far the water descendeth, and flatter the Land lyeth, so the Fens being a far vaster and greater compass lye more flatter, and the Rivers run the slower.

2. Because these Fen-Lands being far greater, and many times more broader than our greatest Meadows, therefore being covered with water, and lying more levell, will not Drayn so fast, and so can not hold comparison in each particular, yet a more suitable Moddell to describe them by, to those that know them not, I cannot Frame.

So that the Fen-Lands so called are as I may say, great Meadows covered over with water in the time of a great Land-Flood; for as upon great raines the Rivers or Water-courses in the uplands are not able to contain the Floods, neither are the Fen Rivers Sewers or Water-courses able to take away those Floods that come out of the higher Countries, or uplands aforesaid. And as the small Brooks first overflow, because of the disproportion betwixt those narrow watercourses, and the floods that run in them, and are unflowed again, when or before the great Rivers begin to rise, and the Flood of the great Rivers continue longer than the lesser, so

The just Form or Model of the Fen-lands.

so the Fen Rivers or Water-courses being much lesser, proportionable to their great Floods than the little brooks are, they can not contain their own water Floods with the Rivers and Floods of the upland Countries too; but are forced over the banks into that great Flat or Levell of Fen-land and Meadow on both sides their Water-courses, and being there dispersed many miles into a great breath and length, and being ever and anon relieved with fresh Land-Floods, most part of Winter long continue, neither having a great fall nor large roomthy Water-courses into the Sea, nor other artificiall Receptacles to receive them, cannot so truly nor suddenly run off again, but had they Water-courses proportionable either in Number or Greatness, to other great Meadows, they would most of them drain themselves, and return to as perfect Meadow and Pasture as any in *England*, for almost all Land-floods and Rivers that lie on the same side of the Country the Fens lie on, from the highest patt of the up-lands, run into, and through the Fens to the Sea, as their constant course, & if the Spring be kindly and moderatly dry, the Fen-water runneth and dryeth away apace, and many times in *February* or the entrance of *March*, especially when the winds sit fair, that is, to drive the waters Sea-ward, they are grazeable with great cattell, and many times with sheep too, and some part of them are all Winter dry and never drowned, and many of those keep as much stock of cattell, especially of sheep, all Winter, as I ever saw any Common or pasture without hay. And to conclude this discription whereby you may not only frame out a Model of the Fens, but discover the Fecibility, if not the only way of Drayning them, which ushereth in my second particular, which is,

2. *The discovery of some of those hindrances or rubs that either hinder or infacilitate this work of Fen-drayning, and they*

they are either in the Land it ſelf, the Commoners or the undertakers thereof

The firſt Hinderance is in the Land.

1. In the Land there may be ſuch Mountaines and Rockineſs betwixt the place you deſire to drain, and the Sea, or River into which you muſt draw your drain, that it may make the work ſo chargeable, as the profits thereof will not counterpoiſe.

2. Alſo there may be ſuch a Vein of Earth, as is ſo Mooriſh, or exceeding Sandy, upon which you muſt be forced to plant your Sluces, or Water-gates, as beſides the extraordinary charge of Workmanſhip, may much hazard the continuance of the Work, and ſo with extraordinary charge, and great hazards, may render the fruits thereof below the expences. Theſe things are poſſible, yet not uſuall.

The Second Hinderance may be in the People. The Commoners, and they may, and do much hinder it in reproaching of the Work it ſelf, as I hinted before, and weary the minds, and weaken the hands of others that would endeavour it: But the greateſt hinderance is their unfaithfulneſs to the Work, by their dulneſs and neglect of raiſing ſufficient ſums of moneys to carry on the Work, and raiſing it ſo ſeaſonably, as may expedite the ſame; for theſe Works are not to be trifled withall, it muſt be the ſpeedy and powerfull carrying on at once, as well as the Artificial and wiſe managing of it. A little ſeaſon loſt, may loſe the coſt and works of a whole Summer, and whileſt neighbors are conteſting about the equality of their Levies, and diſputing every mans Right to pay, and gathering up their moneys, the Works may run further backward in a week, than they were brought forward in a month. I have ſeldome known a rude multitude, or a confuſed heady people ever agree in this; theſe works creep forward, but run

How the Commoner is a hinderance to Fen-drayning.

Poſt backward. Again, the combination of labourers and Poor people may very much prejudice, beſides their ſlothfull and ſleathy ſlubbering of it, if not exceeding carefully overſeen.

How Vndertakers may be a prejudice to the work.

The Third Hinderance may be in the Undertaker, or Drayner. And although this may not be ſuch an Eſſential Prejudice to the Work it ſelf as the reſt are, becauſe a man would think that he that either for his wages or credit works it, ſhould doe his beſt; yet to the common good it may be as deſtructive as the former: And herein, and in the former Hinderance, as I deſire not to diſcourage any Ingenious Spirits; ſo neither doe I deſire to fawn upon the moſt ableſt Attiſt, but doe hereby affirm, that the Undertaker, or Artiſt in this Work may exceedingly Eclipſe the Common Good, and through a corrupt ſelfiſh Spirit may monopolize to his private advantage particular mens Intereſt, and in, and under pretence of doing a Common Good, may utterly ruine thouſand ſouls. Corrupt ſelf, or Corruption it ſelf will endeavour this; but an Ingenious Spirit ſcorns perfidiouſneſs; yet many an Undertaker may in theſe reſpects be an hinderance to the proſperity of Fen-draining, if he be upon a publick Work, for private I meddle not withall.

1. If that he lay not out a good Foundation, he either wholly ſpoils it, or at leaſt bungles out a half work, and leaves the Cream behind him, and it deſtroyes it ſelf at laſt.

2. If that men ſhall pick and cull their Lands, drayn thoſe that are more fecible, and leave out thoſe that are more difficult, I ſay he is an enemy to the common good; And this is a Maxime I ſhall declare, drayn the worſt, and the beſt will drayn it ſelf; and ſometimes the loweſt Lands may, if thoroughly drayned, prove the beſt Lands, and be the ſpeedieſt and eaſieſt way to drain the whole.

3. If that men drain thoſe Lands wherein they are like to have an intereſt, throughly, and thoſe the Commoners hath, more overly; or imbank, or ſecure the one from landfloods, and not the other; or if he make not ſuch a through drain

drain of all as may goe to the bottom, and lay it ſound at root, I am ſure he will not attain the End, the beſt fruit and advantage the Lands will yeeld; which that it may be accompliſhed, I ſhall deſcend to the third Particular.

The Third Particular to be conſidered, is, The Cure, or beſt and ſpeedieſt way of Reducing drowned Lands unto perfect ſoundneſs: A Work too great for my ſhallow parts, and ſcanty leaſure.

And therein becauſe I ſhall not dare to teach men ſo many degrees abler than my ſelf, I ſhall only modeſtly propoſe ſome few Queries, the which if any ſhall anſwer in lines or practice, I ſhall have my End, the Common-wealth will receive more light, and I my ſelf full ſatisfaction

Queries in Fen-drayning.

1. Whether all waters whatſoever, the more they increaſe in quantity, the more in weight? if ſo, then

2. Whether if all waters biggen the further they run, eſpecially in floods, whether then all water-works or cuts muſt not biggen and ſtrengthen alſo, if that a perfect ſecuring from Floods be intended? And if ſo, then

3. Whether all Water-courſes that are made for drains muſt not widen, biggen, and ſtrengthen proportionable both to the Land-floods that come out of the upper Countries, as alſo proportionable to the waters, or downfalls that come from Heaven, and fall upon the ſaid Lands? And ſo require anſwerable Receptacles? if ſo, then

4. Whether, or what is the proportion, or how may a man know the gage thereof, and ſo how to make every courſe equall to the water it muſt carry?

5. Where the greateſt difficulty lies in draining the Fens; whether in draining the Fens from their own naturall waters and moiſture, or in the preſerving them from the Land-floods that come from the high Lands? If the greateſt difficulty be to preſerve them from the Land-floods

of other Lands, as to me seems probable; then whether it would not be more really advantagious to a perfect draining to take off the Land-floods at or before their entrance into the Fens, and so carry them along the Fen-side, under the up-lands, and not suffer them to come into the middle of the Fen, as long as it may be kept off, untill you come to strike with one strait course into the out-let of the Sea or River, or within some few miles thereof? And whether this would not be the likeliest certain means to prevent the just offence the Commoner and Country seemed to take in the last undertaking, who *una voce* cry out that the undertakers secured their own by banks, and preserved them from the Land-floods, and drowned all the Commoners side as much as ever, and that by every considerable Flood? And if this be granted, then I dare conclude the Fen will drain it self with a small course, and with greater speed, and more certainty, as well as more substantially: And so I shall onely move this further, and so refrain.

Reasons why the land floods would be best taken off on the outside the Fen.

6. Whether if any of the aforesaid particulars be affirmed, then must not of necessity all the Out-lets or Mouths of all the Master-work, and Sluces, and Water-gates be widened, and made proportionable to your higher courses, lest that the water receive a check thereby, either to force your Sluces, or give a recoil to the waters into the Fen again, I mean proportionable as well in greatness of the fall, as to the bredth and depth of the water-course?

I shall onely now desire to know, whether when the Master-drains are made substantially deep, it will not be to most advantage to divide the Lands into lesser divisions by small drains, than to cast them out into greater proportions? yet I shall not prescribe so small as some doe, but into the most convenientst divisions may be for the compleat draining.

And as to Sluces, Water-gates, Locks, &c. I shall say little, because they are under the command of Rule, and Truth of Workmanship; and a good experienced Millwright or Engineer is well able to regulate them to as much Advantage, for close shutting, and sutable opening, to the incommin

comming of the Tide, or out-going of the Floods, as the variouſneſs of opportunities will require, which I forbear, becauſe they cannot eaſily be deſcribed without Figures.

And as to the ſeveral Tools to be uſed in the working of theſe Water-courſes, they are common, and moſt of them in common uſe upon the Fens, except a good water-level, which I have at large deſcribed in the tenth Chapter, which is moſt eſſentially neceſſary for the caſting or laying out of all the Works thereof, and a Trenching Plough to cut out the firſt Works, and the Turfing Spade, all largely deſcribed in the 10th. Chapter.

I ſhall onely ſpeak a word or two to the Improvment of ſome particular parcels of Fen-lands which in themſelves are drainable, and without the leaſt dependance upon the general draining, although I will not ſay but ſuch Lands would more eaſily be drained in the general, than it will be done of it ſelf; yet ſeriouſly pondering all things in one even ballance, there may be little difference, and that upon this account; if it be done as a member of the General, then it muſt contribute to the general charge, and ſhare in the general breaches or miſcarriage, and in all particulars ſtand and fall therewith; Alſo then is it ſubject to the ſame hazard as the general is of prejudice, by reaſon of the differences that may ariſe betwixt the Owners, Proprietors, Commoners, Undertakers, or whoſoever, which may be very many, and ſo great, as may tend to the ruine of the whole, which without dependance thereupon they will not be. And I am confident, ſome very conſiderable parcels of Lands lie ſo convenient, and ſo fecible unto the Work, that they may be done moſt eaſily; and others lie more difficultly, and will be done more chargeably; All which I ſhall hold forth under theſe two deſcriptions.

Some particular Lands may be drayned of themſelves, though the generall be not.

1. Are all Lands that lie ſomewhat higher of themſelves, and are never drowned (unleſs it be by ſome extraordinary Inundation) of themſelves, theſe are moſt eaſily recovered of themſelves, at a little more charge than any common lands are incloſed, and that by one good ſubſtantial Dike, well turfed (or ſodded, as the Fen-men call it) on the outſide round

All ſuch Lands are moſt fecible to be drayned.

round about the same, and well rammed and beaten together, it need neither be very broad nor high, the height and weight of the water offending will discover that unto you, nor indeed cost any more than the charge of a good quick Dike, which every good Husband bestows upon a new division; and I dare say there is many thousands of Acres of Lands in many parts of the Fens of this nature.

2. The Second is the more difficult, and yet very fecible also, and that is certain Creeks or corners of Land running into the up-lands, and upon the out-skirts of the Fens, and many out-borders that are only anoyed with their own, and the swelling of the natural Fen-waters, and are cleer from any Land-floods, or up-land waters running through them, and have one or two sides firm, and the securing of one or two sides more will secure the whole. These are easily drainable without dependance upon the draining of the whole Fen, and that by a more substantial imbanking than the former, to secure it self from the great waters of all other Fens, and then there will onely rest to resolve how to drain it self; to which I shall onely say, that having well provided against the waters of bordering Fens, find out the lowest part of all thy Lands, and thither draw a good substantial Master-drain through all thy Lands, and there plant a water-Engine, which may either be wrought by the wind, or by the strength of horse, yea possibly by the strength of two or three men; which if the compass of thy Land be not great, and thy water small, may be but a very inconsiderable charge. And thy Engines may also be divers; as an Engine or Windmil made with a water-wheel, planted in thy Water-course, or Master-drain, or very neer unto it, which water-wheel must be made to that height as may be sure to take out the bottom of the water, and deliver it at the middle of the wheel, which wheel may be contrived into such a form, as that the Ladles, as I may call them, or Peals, or Scoops, as others call them, will cast up, and cast out the water to a confiderable height, as a man doth with a hand-scoop, pail, or kit cast water out of a ditch, which Engine shall at large hereafter

Water Engins helpfull in dra ning.

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after both be deſcribed, and the form of it delineated, or elſe by a good chain-pump, or bucket-work, both which may be made into a Wind-mil-Engine, or elſe with an Engine made with a perpetual Screw; all which for that height as is requirable to the draining of ſuch a Work, will lay a good compaſs of Land dry in a few daies, and if time prevent not, ſhall moſt of them be deſcribed at large.

3. But a Third is moſt difficult, which I yet conceive alſo feſible, and may be recovered alſo to a great advantage: And that is ſuch a parcel of Land that lieth alſo at a skirt, or out-ſide of the Fen, althought it may have ſome Land-flood running through it, or neer it; which Land-flood, if it be poſſible either divert it on the one hand or the other, of the Land you deſire to drain, or elſe if it be a ſmall Floud, within the compaſs and power of an Engine, may alſo be drainable, and by the aforeſaid direction of in-banking the Land, to ſecure the Land-flouds from comming on at all, which with a reaſonable Bank, and a fair open paſſage to convey the Land-flouds clenly away, may preuent the fear thereof; And then a fair Maſter-drain down through the loweſt ground, or neer the middle of the Fen you deſire to drain, which muſt be made ſo deep, as that it may ſubſtantially draw all cold corrupt water into it ſelf: I preſcribe no depth, becauſe I cannot give to all ſorts of Fen-lands (no nor to any other by meaſure) a ſuitable and neceſſary proportion ſo far from off the place where it is to be made, and this drain to be continued to that place where you have moſt conveniencie to land your water, and there planting one of the aforeſaid Engines, I ſhall leave every of them to each mans own affection. I know they will every one doe the Work, and that a very inconſiderable charge, to the profits and advantages to be received and reaped hereby. I ſhall ſay no more in this caſe, becauſe I much more deſire the general Work, which will make all theſe particulars to come on the eaſier. The draining of the whole Fens, yet conſidering the rubs that lie in the way of the general, and the great delaies and uncertainties thereof, I am perſwaded to diſcover the capacities of particulars.

These more difficult, and yet fecible.

As for the particular Engines, the Figures and Delineations of them, they shall hereafter follow, to be described to the very capacity of the Country Farmer, as far as possibly may be: And because I desire to speak to the understanding of the meanest, you must a little bear with my tediousness, till you come to the practice, and then you'l find plainness very usefull, and all I have said, little enough to discover the same.

Now to proceed to the Fourth generall Head of this Discourse, to set forth the best way of Improvement of the aforesaid Lands.

I shall say the less, because through my whole discourse it is my main Scope, and so shall confine my self onely to some of those particulars more peculiar to these Lands, though being substantially drained, they are capable of the impress of any Husbandry whatsoever; I shall therefore divide the Fen-lands into three sorts. 1. The sound dry Land, seldome or never drowned. The Second shall be your constant drowned Lands in times of great Flouds. And the Third shall be your loweſt Land of all, that lieth constantly so wet and cold, that it is turned into a very Moor or Bog.

1. Your dry Lands, I for the present account them the very best, and most capable of raising the greatest present profit, I shall therefore (because it is fruitful of it self to grass, and will yeeld advance enough thereby, and also because there will be enough for many years of the other two sorts remain to husbandrize, and toss and tumble up and down) perswade to lay it all for pasturage, until your other Lands be perfectly recovered and improved; but this may prove undoubtedly excellent Hemp-land, Oad-land, and may be, Mather-land, and most excellent, yea rather too good for Cole and Rape-seed, because there will be other worser. Enough for that.

2. To

2. To the Second sort, onely drowned by up-land floods, and so lie dry when the floud is gone, I say if this be not leavenned with coldness, or steeped so with constant corrupt water, that it is turned into a moorishness, but yet remaines perfect Land, and clear Soard, this very Land may prove your best Land in a little time, and therefore I shall onely for the reducing hereof, advise to a moderate plowing of it; and for the reducing of it to perfect soundness, advise to raise it every plowing, dividing each ground into lands about three yards over, or thereabout, which will take two casts of seed, and in five or six tilths will rise up to so convenient a height, as will lay it sound and dry, and increase your Land also, yet however you must not endeavour the laying any Land any higher than your drains will be sure to draw your furrows: But in case the Level of your water will not admit you to raise up your Lands to so good a height, then you were best make your Lands somewhat lesser, and then the fewer plowings will lay them round and sound: but be carefull not to make your last furrow always in one place, but in each plowing shift one furrow, or more, sometimes one way, and sometimes another, and this will preserve the furrow from overmuch barrenness.

This Land may be suitable and very excellent for Coleseed, and comming to its perfect soundness for most of the aforesaid opportunities, but exceeding rich for all sorts of Grain, out of question, onely I shall earnestly perswade not to plow too oft, nor impoverish it too much at first, for hereby most men undoe their Lands. I conceive it best not to plow any of these Lands no longer than it is brought into a perfect Tilth, or one year after, three years may doe best, though four years may doe well; and you will find a gallant sweet Turf succeed, and soard thick suddenly and sweetly, and your succeeding profits: All things considered, may reach your very benefit of corning to a very neer scantling. I have heard very many object that matchless prejudice by so tedious and thin Soarding, and have affirmed they have tried it by experience, and find plowing wofully destructive; And if you should demand how many years they plowed it, they must needs answer, some 5, some

6, some 7, some 8, and some 10, and others more; and if you again ask them how they laid it down, they must say for the generall, they cast them down, and left an open Ridge to grass; and if you should again demand upon what stubbles or eadish did you lay down your Land for grass, some say upon the Peas stubble, or Barley, and here and there one upon the Oats, which is better than either of the former, but none say upon Wheat or Rie, which I as highly commend, and for the first yeares Soarding goes beyond them all; they neither bestowed any soil upon it first, nor so much as a few hay-seeds at laying down, and yet they will tell you a story of I know not what experiences they have made, when alas they never knew that an Experiment must hold in all its parts, and relate to times, seasons, natures, as well as fruit and crop, and so bring an ill report upon the best husbandry, and stifle their own greatest gain. But of this no more, because in other parts of the Book it is more largely discussed, yet bear with me if repeated, because this is the discovery of the husbanding of a new World, as a man may call it.

A new World may best admit of new Husbandry.

I proceed to the Third sort, which is your lowest Land of all, and lieth deep and long drowned, that it is even turned to very Turf or Bog, and very little useful, onely two or three months in summer it is commonable; but whether profitable or no, I scarce know, nor (being a stranger both in those parts, and to those Lands) will I be peremptorily confident in any thing, as will not hold proportion and use with other Lands; I shall therefore only question whether in commoning upon these Lands they doe not oft stifle their cattel in the morishest places; and whether they rot them not, or choke them not, through many uncurable diseases by reason of the unwholsomness of their pasturage. This I dare affirm, I have seen many poor thin cattel, which hath brought *Pharaohs* lean ill favoured kine into my mind, and such truly as I have not so familiarly seen upon heathy barren Commons, ten Acres whereof is not worth one of these, and yet thousands are prejudiced against the draining of them; but to the Land it self, being recovered and laid dry, it will require more time to recover it self than the other better Lands, and require

require more cost and husbandry to bring it to Fertility; and though all the preceding directions are, or may be applyable here unto it in their proper Seasons, yet some other work may be more naturall as a ground-work to other Husbandry, and that chiefly upon your hassocky moorish rough Land, the which being left to grass, I cannot conceive it worth in its present state not above 3 or 4 *s. per* Acre, and some under, and yet that very same Land, by pains and patience, may recover to be very good Land immediately. I shall therefore advise that this Land be turved, or as some call it, denshired, that is, all the hassocks cut up, and the over-turf pared up, and all laid upon little heaps till throughly dry, and then burned to ashes, and if it be all stringy, rooty, and very combustible matter, then the thicker you pare it up the better; for although I differ from many of the West-Country Husbands about this denshiring their thin turved Lands, that are pure from roots, twitch, or moss, conceiving (that though it bring their Land into sudden Tillage, and to yeeld out it's Spirit the first year) it weakens the Land much, there being no addition to it but a few bushels of ashes to an Acre, instead of good Turf or Soard, that in a Summers working will be easily brought to Tillage, and (as I believe) adds more by far to the fatting of the Land than those ashes doe; and I am sure, when any one layeth down his Lands to grass, upon this Husbandry, the Soard comes pale and wan, and very lean and low, and never riseth to a good Crop, and whosoever seriously observes the same, shal find that very issue; yet to Lands of this nature I as highly extoll it, and to all such foul Lands, where is depth of soil enough, and all so combustible as nothing else will work it unto Tillage. In the midst of *May*, or any time in the very beginning of Summer, when the Land is thorough dry, is best, and the earliest also, that you may have as much of the Summer as you can, to the working of your other Tillages, which being burned in a dry season, proceed to plowing and ridging up your Lands, and dividing them into such proportions as your drains will bear, as is directed in the aforesaid last particular, & this will then be fit to take the impress of any seed; much of this will bear Cole-seed, or any grain, which I leave to the dis-

Denshiring Fen-lands very useful.

Denshiring lands reproved in the West.

Burning Land extolled in the North.

discretion of the Country Experiences, onely pray you study laying all sound and warm; plow not too long, and lay it down to grass either upon the Oat-stubble, which will soard exceeding well the second year, if not the first; or upon wheat or Rie, the Land harrowed and laid very smooth; this will soard exceedingly the first year, as in other places of the Book I have at large discoursed. And as your Land recovers soundness, you will by your improving your own experiences, have more Talents added to these, you have more opportunities to raise new advantages out of them.

Lands drowned by the Sea.

Now to the conclusion of this Chapter, I shall onely add a word or two of the Sea-drowned Lands, and it shall be very little, because as to the improvements of them whatever hath been before spoken and applied to other Lands, may be to these, which being once recovered, are very sound dry Land many of them; and the rest may be reduced thereunto by good divisions and draines, as in all other Marsh-Lands.

All the mystery of this is in the recovery of them, which to discourse at large, would be more tedious than profitable, because as to the materials for imbanking or bounding the Sea, whether Stone, Chalk, Wood, or Earth, little can be said, because all must be referred to the conveniency and necessity of the place upon which they are requirable, only there must be great regard had to the force of the Sea that lies upon them, and the strength and violence of the winds to which it lieth most obnoxious; for I am perswaded it is not so oft the Sea it self that makes the breach, as the strength of the winds that forceth it over the banks; neither can I prescribe the severall Locks or Water-gates necessary for letting out the Heavens water, nor the bigness or strength of them, that being proper to the place upon which they are to be erected, there to be discoursed and described, and the common Engineers are very customarily used thereto; As to some good ingenious painfull Artist, little can be added, so that there remains onely that I advise to these two or three general directions.

First, That you be very carefully observant of the power and way of the Seas working; for although it is possible much

Lands

Lands may be gained from the Sea, yet it is not poſſible at all times to keep the ſame when it is gained; therefore where-ever you ſee the Sea get or recover upon any Land, be wary there, rather ſtudy to ſtop the Sea there on the borders, and to divert the force of it another way, which will ſometime more eaſily receive a check than at other times and places; but if that be not ſtayable, I ſhould adviſe not to be to buſy there, but where the Sea loſeth, and Land increaſeth, there is a more probable opportunity, and there I ſhould rather pitch down my ſtaff. There is ſtore of theſe Lands to be recovered, ſo that I would not perſwade any to ſtreighten themſelves with hazards and inconveniences, when there is ſuch a wide opportunity for the ingenious to improve both parts and purſes on the borders of theſe Nations.

Secondly, Be very careſull of placing your out-fals and water-gates in ſo convenient parts as may both be beſt for the firm draining of your Lands, and for the firm founding of your Sluces and Water-gates, both in relation to the Earth you plant them on, and the force or ſtrength of the water that lieth againſt them, or accidentally through ſome fierce ſtorm that may come upon them; this hath been the overthrow of ſome gallant works, and particular rules here cannot be diſcourſed but through ſo much tediouſneſs as will tire thy patience, which I muſt forbear.

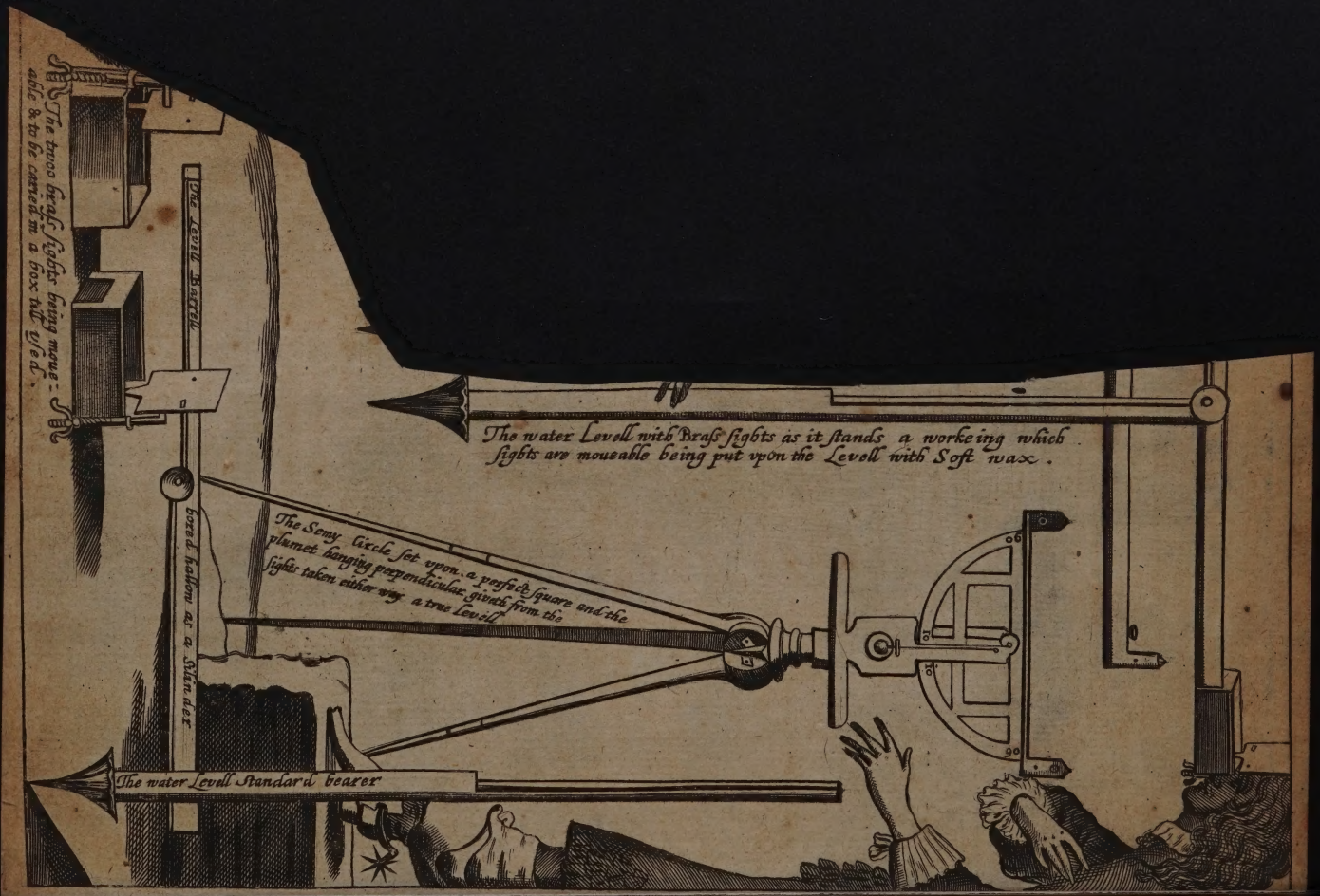
Thirdly, Be above meaſure ſtudious about thy Imbankments, that a foundation be ſo firmly laid to the bottom with ſuch materials as will hold out the triall; therefore in every new work ſome triall would be made of all materials, and therein thou muſt be ſteered by thoſe the very place affords, whether Stone, Chalk, Wood, or Earth, or all, and the preſent experience upon the place will be a better Tutor than I can poſſibly, for I much queſtion whether the carriage of any of theſe far, will anſwer the coſt or hazards run therein. Be ſure your foundation be broad, well ramm'd together, and ſo raiſed with ſolid matter and workmanſhip a good height above the higheſt Tides, and curiouſly turved or ſodded on the Sea-ſide; the better is your Turf the firmer is your work; for if that it once begin to hole, or break, look to the main, it is in danger, and ever be ſure your new works be made the higheſt,

highest, because an overflowing upon an old work is not so dangerous as upon the new, that it quickly and easily overthrows.

Lastly, Be sure of ingenious and laborious workmen; an idle slubberer will both deceive the work and Master, study not so much cheap wages, as to have your work well done for good wages; carefull ingenious Overseers of the Labourers is an unvalued furtherance to the work, some men have an excellent *Genius* that way, will awe men more with their wise industrious oversight, and skill in mens frame of Spirits, and wise designing each man to his place and work, that all of them shal be as members of the Body, co-adjutors to the whole, one take it from another, so as no work be done twice over, nor one mans labour bear out another mans sloth, but each be helpfull to another, so as to advance the main. I tell you this is a mystery, and a man rightly qualified for this work is worth gold, and very rarely to be found. I have seen some Bayliffs intrusted herein, stand telling a story, while all his workmen have stood looking him in the face, admiring him for his Rethorick, and this hath pleased him as well as their working; many have an easie way of hindering work, but few of furthering it, and he is a rare man that can sort all his works so into each workmans hand, as that it goes on to purpose; confusion is through ignorance and sloth; a good method, or plat-form to advance each mans labour to the best furtherance of a work, is difficult, requires great ingenuity, and laborious study, I find it most difficult, though I have had as large experience of it as most Englishmen, yet cannot accomplish it, but many times ran into confusion, through mens rudeness, and my want of each particular experience in each work, the which I instance as a Rock for others, to beware, and prize and value a good Overseer, whose countenance and conversation is such with workmen, as will not onely awe and force them, but his wise and loving demeanor will compel them to their utmost faithfulness; a work in its gears will thrive exceedingly. And so I have done at present with this particular, till I have gained some more, and new experiences; and with this Chapter.

A good Overseer worth Gold.

CHAP.


The two brass sights being move-able & to be carried in a box till used.
The Level Barrell
bored hollow as a Stander
The water Levell Standard bearer
The Semy Circle set upon a perfect square and the plumet hanging perpendicular giveth from the sights taken either way a true Levell
The water Levell with Brass sights as it stands a working which sights are moueable being put upon the Levell with Soft wax.

CHAP. X.

The Tenth Chapter giveth directions to make and use certaine Tooles, or Instruments which shall much facilitate the Worke.

AND for thy further incouragement, because Drayning and Trenching is found very chargable, therefore in the third place I will discover certaine Tooles or Instruments, which shall make the worke more facile and delightfull, with which two Workmen, (and indeed any Ingenious man may quickly attaine a handinesse, and dexterousnesse therein) that can well handle them; And shall doe more than many common Labourers doe in one day with their ordinary Tooles, and shall worke more true, and more sutable and commendable to the nature of this way of Improvement; which Tooles are all very plain, and simple, without severall motions, or divisions, made onely for ease, lightnesse, and quickenesse, not for Admiration or Confusion.

Tooles belonging to floating and Trenching, to make the work more easie and lesse chargable.

The first is a good Line about thirty two yards long, made of the best Water-wrought Hemp, and as big again as Whipcord, upon a good Reele to winde it upon; I prescribe this length because of drawing all Workes as near unto a strait Line as possible may be; which length is of use in measuring your Work by the Pearch or Rod as you desire also, and no more of this.

A good Line.

The sencond is a Water Levell about five foot long, the longer the better, but that it will be the far more unportable, but foure foot and an half will do reasonable well; which Instrument many have assayed and made, some open with a Channell for the water to run all along upon a three inched Piece of Oake, with sights placed at each end, true to the

A Water-Levell.

water, that is each ſight of a juſt proportion from the water, to direct the Levell, but this lyeth ſo open to the Winde, and is troubleſome removing, that it is not worth preſcribing.

Others have uſed them of ſeven or eight foot long, to be placed on two or three legs, as the Surveyor placeth the plain Table, the Leuell made with an hollow Concave, for the water to lye hid from the Winde, and to come up in two Cups (above the wood) planted in the Levell, and ſights planted very Artificially thereto, the water in each Cup holding his juſt proportion to both ſights, and this is a very good one, but very troubleſome to remove up and downe, and to make diſpatch when one hath need; And in this ſecond forme were Sir *Edward Peto* his Levels made very coſtly, and the Sights of good value, whoſe Ingenuity was very great, and the Inſtrument very good and rich, but a little troubleſome to carry up and downe; but I rather chuſe a plainer Piece which is very Portable, and it is made to fold into another ſquare Staffe, and ſo to carry like an Hunting-Pole, my Staffe is but five foot and an half long, made of the beſt young ſeaſoned Oake that can be got; my Levell, or the Barrel of it is but fourfoot and an half, or five foot long, which Barrell in the middeſt of it, is planted into the top of my Staffe thus; Juſt upon the middeſt of my Barrell is a pair of Iron joynts curiouſly wrought into the very middeſt of my Barrell, on the neather ſide of it, and at the very over-end of my Staffe, and ſo much of the one part of my Staffe, and juſt halfe the length of my Barrell taken away with a moulding or rabatating plaine, untill both joyned together with theſe joynts make one compleat Staffe ſtrait, and formable, onely about a quarter of an Inch taper upwards, from the bottome to the top, that it may not be too top-heavy, and the Sights are to be fixed unto both ends of the Levell Barrell, that they ſtand firme and hold water, and yet are very little or no annoyance, either to Sight or Practice; And in the portage of it, it is a faire ſtrait Staffe, with a ſtrong Pike in the bottome of the Staffe, and a ſtep to ſet the foot, or force it into the ground where there is no occaſion to uſe it;

Sir *Edward Peto* his Level.

The manner and forme of a true, and the ſpeedieſt Level that I can deviſe.

it; And in the Exerciſe of it, being unfolded it is an headleſſe Croſſe, not much unlike the Surveyers croſſe Staffe; which when thou haſt done thy work thou mayſt fold it up againe, and walk as with an Hunting-Pole. Any good Gunſmith will make the Iron-work, and ſome Gun-ſmiths will make the Wooden-work alſo with direction, but properly it belongeth to the Joyner. Who are the makers of it.

The next is the Trenching-Plough, or Coulter, whoſe ſpeciall uſe is to cut out the Trench on both ſides with great expedition, which is thus made; Take a Piece of the beſt tough Willow, about the bigneſſe of a Spade-ſtayle, ſomewhat ſtrait onely at the neather end, it muſt looke upward with a neck like a foot which muſt run upon the ground, and juſt above the neck muſt be an Iron, or little Coulter about the ſtrength of a Butchers Knife, planted in the Stayle, where the Stayle muſt be plated with Iron, curiouſly let into the Wood on both ſides, through which, as alſo the Wood, the tange of the Coulter muſt come, with a Cotter-hole in it above, to cotter it cloſe to the over-ſide of the Staffe, or rather have two Coulters, one about an Inch and halfe longer and ſtronger than the other, that ſo in ſoft deep ground thou mayſt uſe the longeſt, and in dry ground the ſhorteſt. The Trenching Plough.

Whoſe uſe is, when that thou haſt caſt out thy Trench, and ſet thy Line, thou mayſt with this run along thy Line, and cut out one ſide of thy Trench, almoſt as faſt as a man can fallow it, and then ſet out thy other ſide, and cut it out alſo; but if thou ſtudieſt more exactneſſe, then in the foot of thy Staffe, and in the middle of thy foot, plant a little Brazen Wheele about four Inches high, that ſo the foot may beare it ſelfe a little upon the Wheele, which will occaſion it to run more pleaſantly; but the Wheele muſt alſo be curiouſly planted into the foot with Plates, and upon an Iron Axeltree, wherewith thou mayſt cut out a Pearch, whilſt ſome will be cutting out two yards, and more true and certaine; and ſo alſo mayſt thou uſe it ſpeedily to cut out thy Turfe overthwart thy Trench about eighteene inches, or twenty inches broad, a fit proportion to be taken up, or

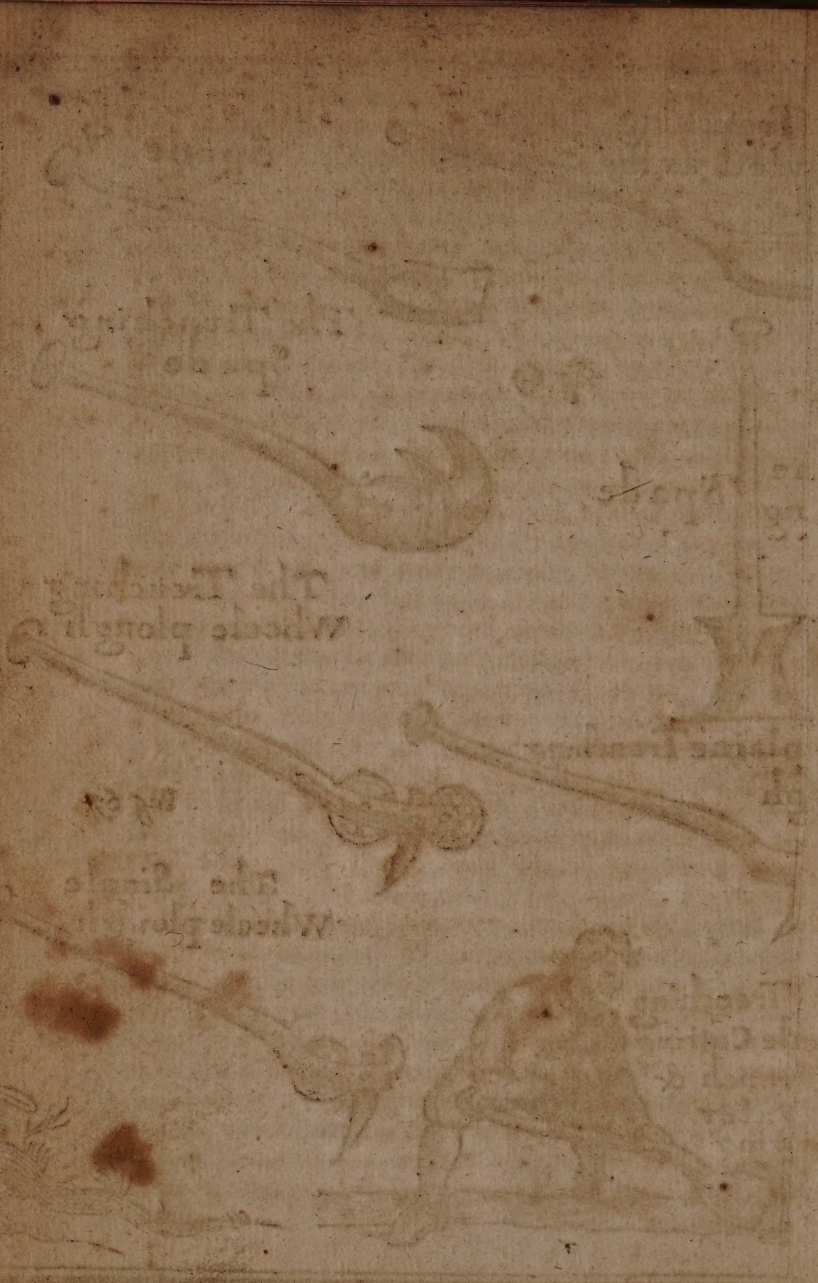
ſometimes two foot broad; for if thou wouldeſt take up all thy Turfe as curiouſly cut ſquare, and pared up about three or four Inches thick all of one thickneſſe, juſt at the roote of the Graſſe, as aforeſaid, of which thou mayſt make exceeding great uſe, which thou muſt preſerve moſt choicely, for therewith thou maiſt cover thy bare places of Earth, or any low places that thou wouldeſt raiſe up to a Levell, and mayſt have as good Graſſe upon it within halfe a yeare, better than upon the other Lands; For the taking up of which Turfe thou muſt make a Spade on purpoſe, with a bit looking up twice ſo much as our ordinary Spades doe, with a curious thin ſhooe looking up alſo; whoſe bit muſt be exceeding well ſteeled, and more broader at the point, or neather end of the bit, than at the over end about halfe an inch, and not above by no meanes; which will take up the Turfe all at one thickneſſe, juſt at the naturall height a man uſeth it, as he ſtands to ſhovell Earth before him. This Spade is admirable uſefull to cleanſe the bottome of Trenches, for which uſe it were very neceſſary to have another an inch and halfe narrower than the former, for leſſer and narrower Trenches; which Spades (the broadeſt ſort of them) are more ſpeedy, and more eaſie for Banking and Levelling high places, and great Ant-hills, by farre then other Common Spades are.

Turving-Spade.

The next Toole that is to be ſhadowed to thee is the Trenching Spade, which you may make betwixt Foure and Five Inches broad, and if you make Two, which is better, One may be Foure Inches, and the other may be Six Inches wide, whoſe Tree muſt be made more compaſſe, and looking up, by farre, than your uſuall Spades are, yea ſomewhat more compaſſe than your Turving Spade is, though but a very little, ſo that it may carry a Trench Levell before you, being forced by your ſtrength of Arme, guided from about the bottome of your Belly, as you uſe the Shovell in any thing you cleanſe; which Spade ſhooe muſt be made with two ſides, or Langets, up from the end of the bit, like as if you would plant two broad Knife Blades to looke upwards with their points upon a common Spade, from the

The Trenching Spade.

The Trenching gouge to be vſed as the Spade
The Turving Spade
The Trenching Spade
pag: 69
The paring Spade
The Trenching Wheele plough
The plaine Trenching Plough
Pag: 67
The Single Wheele plough
The Trenching Spade Cutting its trench & the Water Following



the end of your Spade bit, onely they muſt be made a little ſtronger, yet they need not be above two Inches broad at the very bit, and as thin as the ſtrength of the worke will bear, little thicker than a ſtrong Knife, and ſo Narrower and Narrower upwards, untill it come to half an Inch, and about Five Inches long, which muſt be made very exact, and true, ſmooth, and ſharp, otherwiſe it will not worke forth his Coare, and Furrow clearly, and eaſily, but will be above a mans naturall ſtrength; but if it be rightly made, any man may eaſily work forth a Trench at one time, and very faſt, almoſt as faſt as a man can thruſt a Shovell under a little Sand or Dung before him. Some have aſſayed to make this Trenching Spade rudely and in other formes, which I will not ſtand here to diſprove, becauſe their own Experience hath layd down the uſe of them, but this I am certaine of in my own knowledge is wonderfull uſefull, and herewith one man may doe more in ſuch worke as this (which to make greater Trenches is but to make more work to no purpoſe) and that more formally and Artificially, than ſix men can doe with their own naturall and uſuall Tooles, and they ſhall moyle and ſpoyle leſſe ground by many degrees, which Toole ſo cutteth out his Furrow and Coare, that you may within a week or two, or when you have accompliſhed your deſire, lay it downe againe, and no whit prejudice the leaſt Graſſe, and none ſhall be the wiſer for it, or Diſcover within two or three dayes whether ſuch a thing was yea or no, and ſo will prevent the leaſt ſpoyle.

There is another Toole or two as uſefull in theſe works, and no leſſe neceſſary, and this is the Paring Spade, or dividing Iron, whoſe bit may be made all of Iron, being a ſtrong Iron Plate, with a good ſtrong Socket, to put a ſtrait tough Stale or Helve into, it muſt be made juſt ſtrait every way, the Bit muſt be made twenty Inches long, the two ſides, and neather end all well ſteeled, the neather part of the bit a little bellied or ſquare, and the ſides a little hollow or compaſſed, and the end and ſides as ſharp as they can be made, for the eſpeciall uſe of this is now and then to cut out a The Paring Spade.

The use of the Paring Spade.

Trench in vallies, and low places, where thy Plough cannot come at it, but principally to pare old Trenches after the first yeare, whose Edges will grow so thick with Grasse, that thou canst not get thy water to passe currently, and to dig it will break thy Trench, and cut it too thick, but with this thou mayst cut it as with a Cutting Knife all along thy Trench or Line, very fast, and most compleat; Thy Staile need not be so long as a naturall Spade-staile, it must be kept clean and bright, and it will worke exceeding easie; And thy ordinary Spades also the better they are and the sharper, and curiously kept, the better will they rid off worke by far, and the more easie, and delightfull to the Workman, and not fur and clog with Earth, which makes the worke go off very heavily.

The Third Piece of Improvement ſhews how to Encloſe without offence, and prevent Depopulation that is moſt common Attendant and Apurtenant to Encloſure, and how to make Severall all Errable Common Field Lands, and alſo all Common Heaths, Moores, Forreſts, Waſts, to every particular Intereſts, and the Commonwealths great Advantage.

CHAP. XI.

The Eleventh Chapter Treateth of Improving Land by Paſture, Reproves Depopulation, Proves excellent Advantage by Encloſure, and taketh away the uſuall Scandals layd upon it.

THis Piece of Improvement will be the better carryed on, if we could but prevent two great Rocks men are apt to daſh upon, and keep the Medium betwixt both.

The one is ſo Extreame for Paſturing and Grazing, as he will deſtroy Tillage, and raiſing of Corne, 1 Extreame.

ſo

so he may convert all to sheepe, Wooll, and Cattell; though the contrary be of incomparable more Advantage, Credit, and Glory.

2 Extreame. The other all for Tillage, and Ploughing, that he will toyle all his dayes himselfe and Family for nothing, in and upon his common erable feilde Land, up early and downe late, drudge and moyle and ware out himselfe and Family: rather then he will cast how he may Improve his Lands by Impasturing, and Enclosing of it, whereby he may raise more profit in Sheep, Wools, Cattell, and far more Corne also if he please upon every Acre.

For the discovering a little these selfe deceivers to themselves I shall speake a worde or two more large to each Extreame.

The first Extreame is, partly through so deepe an Affertation of Tillage and plowing in Common, although it be to his perpetuall slavery and drudgery all his dayes, he wil not leave it, and especially through a prejudice he hath taken against Enclosure throngh some mens depopulation and oppression, and destruction of Tillage, that he will not approve hereof upon any Tearmes, but oppose with all the might and maine he can; what sayth he, Enclose, depopulate, destroy the poore, no our fathers lived well upon their land without Enclosure, kept good hospitality, many servants, and bred up many children, and abhominated the thoughts thereof, and so will wee prevent it if we can, wee will toyle and moyle all our dayes, and breed up our children to keep sheepe, house our beast, kick up their heeles upon a banke, flit our horses, and breed them up to take our inheritance of Thirty, Forty, or Fifty pounds by the yeare, with which few can scarce bring both ends together by the yeares end, as dayly experience shewes, they not once considering the fruite of Idlenesse, not the great Improvement of this honest equall Enclosure, nor their children, ruine for want of learning, Trade or good breeding, the least whereof is better or may be better to them then all their lands. Witnesse thousands

thouſands in England that prefer their children better with a little good breeding, with little portion, then they can or uſually doe with all their inheritance.

The ſecond extreame is as like the former as can be, and is no prejudiciall to the Common-Wealth, nor deſtructive to good husbandry, and it ariſeth out of baſe private humour of ſloth and ſelfe will, and want of a wiſe Spirit of diſcerning in Improvements, and becauſe he ſeeth ſome men have abuſed their Paſture-Land by over plowing, and tooke out the Spirit and life thereof, that it will not come to it ſelfe of many yeares (which is an ill piece of providence indeed) therefore he will not plough any old Paſture Land at all, upon any tearmes, or for any time, no though his Land be ſo decayed and impoveriſhed, that that Land which would have maintayned much cattell, will not now maintaine ſo much by one third part or a quarterne, as it did after the firſt through ſoarding: and by reaſon either of the wet and cold yeare, or the overpowring of the moſſe or Anthills, or ſome other traſh; it puts not that proofe into Cattell nor ſcarce halfe as it did at the firſt Soarding; nay though it calls loud for plowing and will be much bettered, and the Rent doubled, yet he will not have it plowed come what will, what ſaith he, deſtroy my old Paſture, my ſheepe walkes and beggar my Land, all the world ſhall not perſwade him to that, you may as ſoone perſwade him not to eate good wholſome food, becauſe ſome men overcharged their ſtomacks by exceſſe herein, becauſe here and there an indiſcreet man did wrong his Land by exceſſive plowing, he will not uſe it at all, not moderately though he may feed or better it thereby; No ſaith he, I can raiſe a conſtant profit by my Woolle and lambe, my fat beefe and mutton, at an eaſie quiet way unto my ſelf and family without much vexing or turmoyling (which is a gallant way of living, and I ſhall exceedingly adviſe and commend it too, untill the Land degenerate; and cals out for plowing, or the Common-wealth calls out for corning and will yeeld far better advance thereby.) he takes more content in a Sheep heard and his dogge and in his own will and eaſe, than in greater advantage, and

as the other Extreame will hinder all Improvements he can by way of Encloſure under pretence of one throwing Tillage (though a man may till as much and get far more Corne in Paſture then in Common if he will) ſo will this out of as vaine and ſenleſſe pretenſes hinder all Corneing in paſture leaſt he ſhould prejudice his Land for grazeing, although he may moderate corning, better his Land to grazing alſo, and ſo have I erected a Sea marke upon both theſe Rocks, that all men may take heed of daſling themſelves thereon, the Ingenions I am ſure will never come neare them. But for ſatisfaction to the firſt extreame maintayned by that generation of ſtrange men that oppoſe Encloſure, yet ſee every day the Rents of thoſe Lands Improved, ſome doubled, ſome more ſome leſſe; and the Land certainly advanced by it, one Acre made worth three or foure, and after a while will bare more Corne without ſoyle for three or foure yeare, then divers Acres as it was before in Common, that onely ſay Encloſure may as eaſily be made without depopulation as with it; and to the other Extreame.

I am not aſhamed to maintaine, as a reproofe to this Extreame, that many ten thouſand Acres of Land in *England*, may yeeld a double profit divers yeares, by ploughing, and afterwards yeeld as much rent as ever before, and poſſibly much more; Nay, I'le ſay, obſerve my Directions punctually; And I'le make good the old Rent the very firſt yeare, after Plowing, and begin to enter upon it as ſoone as the Crop is reaped off, and begin my yeare with Winter too, which is accounted the worſt Advantage to the Tennant, and ſo for Seven, Ten, or Twenty, upon many ſorts of Lands in *England* of the aforeſaid Value; But to ſtop the mouthes of ſuch Madcaps in each Extreame, and make good my Propoſition; I will begin, and try whether I can hold out Encloſure without any Depopulation, or the leaſt prejudice, and then proceed to a full anſwer to the reſt.

Encloſure held forth without Depopulation.

And ſecondly that your Arable or Common Field Lands, or common Heathes, Moores or Forreſts may be highly Advanced; that is out of queſtion I ſuppoſe, denyed ſcarce by any, that have had ſeven yeares Experience of the Diſ-

Diſproportion betwixt the profits of one Lordſhip in Common, and the next adjoyning to it Incloſed; The one worth three hundred pounds in Common, the other neare a thouſand in Paſture.

Now here lyeth the Trick indeed to make this Improvement, and neither Prejudice Poore, nor Miniſter, Labourer, nor Farmer, Tennant nor Landlord, One nor Other, that hath any proper Right of Intereſt therein, and not Depopulate.

For the holding forth of which, I will Demonſtrate ſuch a Method, or way of Encloſure (without Depopulation, as all men in particular ſhall have a Proportionable Advance thereby, And the Commo Wealth a Double or Treble, and Tillage Advanced alſo, and ſo the one Extreame prevented, and no man hindred, all which ſhall admit of no other Inconvenience than this, *viz.*

The prevention in great meaſue of *Idleneſſe* and *Oppreſſion*, 'tis true, it will remove or take away it may be a Shephard, or a Boy or Girle from keeping Cattell, who are more fit for Schoole or Trade, and put the Sheepard to the Spade, or it may be prevent ſome great Oppreſſor of the Commons, that drives off all poore Commoners off their Commons by his great Flocks and Heards, whom this Project may drive off his Sheep walkes, who lives juſt upon the Common ſide and eates out the Poore, and others that live more remote; And alſo happily prevent a Rot eſpecially when tis ſoarded (which uſually is once in foure or five yeares in moſt part of this Nation, which deſtroyes all before it, and conſumeth the Care and Paines of the Oppreſſor too and others together, of all the other yeares profit at once; And poſſibly may for a little ſeaſon bring downe the Price of Sheep, Cattell, and ſome other things (by reaſon of plenty of Sheep ſo ſuddainly deſtroyed) being of ſo ill a name to a low rate; Which were it not for that Rotting Deluge their Increaſe would be beyong *Arithmaticall* Demonſtration; But for a long ſeaſon afterwards raiſeth them to a double Rate immediately againe: And poſſibly it may be as an Engine to facilitate moſt parts of Husbands

The grandeſt evill of a juſt and equall Incloſure prevents Idleneſſe and Opreſſion onely.

Encloſure prevents the Rot of ſheep exceedingly

Incloſure may occaſion more worke done at an eaſier charge.

bandry, and cause a great deale of worke to be done wit h fewer hands, and yet before the Discourse be ended, I'le find all sorts worke enough to all mens Advantage s whatsoever, and these are the Inconveniences of Inclosure and Good Husbandry; Others I know none, the conveniences follow also, if any more or greater shall be proposed I shall indeavour to Aswer them in the Sequell.

CHAP. XII.

Sheweth the Land capaple of Enclosure; And the Method of it, how it Advanceth the Publick Weale and all particular Interests.

Lands capable of enclosure.

AND to this end consinder that all Lands capable of Enclosure, are either Common Fields and Arable Lands: Mens proper Right, and Inheritance, or else Common Pasturing upon Heathes, Moores, Marshes, or Forrests Lands.

For the Enclosure of your common field, Arable Land, I lay downe this Direction; All Interests to be provided for, which I conceive may be reduced to these foure.

1. First, either Lord of the soyle or Landlord, or,
2. Secondly, the Minister to the People, or else
3. Thirdly, the Freeholder farmour or Tennant or
4. lastly Fourthly, the Poore Labourer or Cottier.

All which having some Interests more or lesse, shall be seriously considered of.

Cottier provided for.

Therefore I begin with the last, the Poore Cottier, or day Labourer, And provide for him, because he hath ever bin oppressed if any, and last or least provided for, And looke what right or Interest he hath in Common, Ile first allot out his proportion into severall with the better, rather then with the worse, a Proportion out of every mans Inheritance, and so

ſo much, or ſo many Cattell as he may keep in Common, hee ſhall keep in Paſture, or rather more, at as eaſie a rate as they pay for it in Common, for there lives that now live upon it: And ever after at an under Value, and ſo I cannot poſſibly conceive that hee hath any cauſe to be offended.

Labouret provided for.

And for the Labourer, you ſhall ſee how I ſhall provide for him too before I have done, beſides the allotment of his Proportion, as to the Cottier, or to what Right ſoever he hath of due or Cuſtome.

Miniſter provided for.

Then for the Miniſter in the next place, becauſe he hath ſeemed to be the Oppoſer of it, moſt uſually: And truly ſo he had good reaſon, as the ſtate of things formerly ſtood with him: (For though I believe that Tyethes are neither conſonant to a *Goſpel Miniſter*, (the Liſt of which diſpute become me not, nor I intend not to enter in, nor yet Conducing to a ſweet Compliance with his people) Yet I alſo ſay, that ſhould a Miniſter either have excepted the peoples benevolence of our ordinary *Engliſh* Pariſhes for his pay: Or have ſtood to the Courteſie of the Lord, or Freeholder, what he ſhould have had upon the Incloſure: I feare, for the one it would have been too little for a Miniſters Maintenance: And for the other, he might goe barefoot, and his Family a beging, for what the Common people would Contribute to his Subſiſtance.

Tithes not Goſpel wayes maintenance.

And therefore would have him to have his Proportion next, and a very ſubſtantiall Livelihood allotted out of the Lands Incloſed, untill the State ſhall ſettle a more better or more ſutable way of Maintenance for him; If there be either a Competent number of people for him to preach unto; or Competency of Land to raiſe it from in every Pariſh, or elſe two or more Pariſhes that joyne conveniently to be laid together: (And according to what his Right or Proportion) (if he have it in way of Tything) to be Incloſed, or caſt into paſture for him by himſelfe, with as much Conveniency for his dwelling as may be.

And where either Incloſure cannot be agreed upon, or made (as poſſibly in ſome parts it may not Conſiſt with all mens advantages) I conceive there may be an Agreement

made for the allotment of the Ministers Proportion, to be cast into Pasture, so that were his Tenth Enclosed, it would be so gallant a Maintenance for him; And contentfull to all Parties, that it would remove all troubles, or ocasion of Confusion, and Increase Love and Unity, which Tythings have ever occasioned Divisions and Contentions: Which either he may Imploy his Wife and Family upon part thereof for necessary Maintenance: And set (with much more ease) the rest to free his Family from Care and trouble: And so receive his pay every halfe yeare without the least Distraction. I would have him to have such a large Allotment and Proportion, as might inable him to be Capable of Hospitality, *of which he is to be a Lover*, and farre better able to give then to receive, and to Administer to others, then to be administred unto by way of Charity.

1. Tit 8.

Depopulation reproved.

And as for the great depopulation in the Nation that hath devoured poor and Tenant, overthrow Corneing and good Husbandry, and in some parts Minister and all, and yet persist by keeping their Land from Tillage when it wants it; when Country, the Landlords profit, the Markets, the Labourer, Poore, and Land it selfe and all calls for it is no lesse then grand oppression.

Impropiations to be thought of.

As also for other places where no Maintenance is assigned for the Minister, but the people starve for want of Bread, and were those great Impropiations are that devoure all the Profits, and have all to a short-coat Vicaridge; How these things should be mended, is infinitely beyond my Sphere; how Ministers should be raised, maintenance and all Interest preserved, I know not; only I shall pray the wise God to direct our highest Counsells in regulating these distractions, for it is farre beyond my shallow capacity how to advise..

Free-holder.

And for the Free-holder Farmar or Tennant, I question not the Free-holders offence, for he having his proportion I know it will be doubled and more to his Advantage.

And for the Tennant let him also share in some Advancement, either let him injoy it at an easie rate, that looke whatsoever Bargaine he hath in common by the yeare, he may

may have a better upon the Encloſure; or elſe let him take a Leaſe for Lives, or Yeares, that as he enjoyes the worſt, upon the firſt Incloſure, ſo he may the beſt alſo, having a good Tearme of time therein, and then I hope he will not wrangle neither; for I am ſure he need neither Moyle nor Carke as he did before, but manage his buſineſſe with more eaſe, ſweet content, and advance of profit.

Lord of the Soyle, or Landlord.

And for the Land-Lord, or Lord I ſhall not much beſpeake his favour, or Approbation, for he will beleeve me without Demonſtration that there will be a viſible and conſiderable advance fall upon him, only crave his patience, that he'le not be offended, that I ſeeme (and but ſeeme ſo ſo to doe) to project to give away his Right as to the Poore, which in Common is there owne, whether by Right Cuſtome, (for I ſpeake of no other in this place but ſuch as have right of Common) and ſo they may require ſo much by Law; but to encourage them, and to remove offence and ſcandall I adviſe it. And when all theſe particulars concerned in their ſeverall Rights are ſatisfied, we ſhall doe well; and yet the great Block and Prejudice is yet to be removed, which is, The deſtruction of Corne, and Tillage, which I promiſed to cleare, which followes here.

How Incloſure ſhall not prejudice the increaſe of Corne or foode.

Firſt I indeavour before Encloſure, that either by ingagements ſo firme and ſurely made, by all parties concerned in it, as they may fall under Law to be recovered; Or elſe by a particular State Law enacted to this end, ſo to Ingage all men in this new Incloſure to alot, or caſt out one third part or thereabout at leaſt of all their Lands conſtantly for Tillage; or what more at any time they pleaſe, One third part for Meadow, And another third part for Paſture, or feeding Land, which third part for Tillage if my conceptions faile not, Firſt with the helpe of all that Soyle that the Hay of the other third part will raiſe in maintaining all the Cattell in Winter, that they Paſtured in ſummer upon the other third part, which I conceive may be as many more; and alſo.

Foure Arguments to prove the advantage by Encloſure, and that more Corne may be raiſed being Incloſed then Common.

Secondly, by that advantage there will be ſometime Plowing on Paſture, and reſting Another, whereby freſh Land

Land and Reſtey for ſome yeares will beare more Corne without Manure, then it did before with it, and indeed alſo after ſome yeares of reſting may ſtand in need of Plowing, and poſſibly may advance the Land by it, as I am ſure they will, all our Wood-land, courſer Lands whatſoever, that are either ſubject to the Moſſe, or Ruſh, or Anthills whatever it will doe to better.

Thirdly, well knowing (that without queſtion) one Acre of well Manured and Husbandryed Land, will yeeld more fruit then two or three otherwiſe; A principle undeniable.

Fourthly, conſider the vaſt advantage there will be by Husbandring a little well, I ſay; it is cleare ſome one Acre manured, plowed, and husbandred in ſeaſon, and unto that height of Richneſſe the Land and ſeed ſowed doth require, may and doth uſually beare as much Corne as two or three ill husbandred as aforeſaid. Then ballance the Buſineſſe, and weigh but the advantage. One Acre beareth the fruit of three, the two Acres are preſerved to graze, the ſeed and all other charges of two Acres is preſerved to helpe the Markets; The Husbandry, and Plowing, and ſowing of two Acres is alſo ſaved. Oh conſider it, and neither be ſuch Enemies to the State, nor of your ſelves and Common-wealth ſo great Abuſers of Ingenuity and Good Husbandry ſo great Traducers; When men have their Lands encloſed, and at their owne command, I feare not but moſt men will covet to Husbandry every Acre ſo well, as it may yeeld forth the utmoſt fruit it is poſſibly able to produce, having the reſt at their own Command alſo, to Imploy to another Advantage. Which done halfe the Land in *England* thus managed would yeeld more then all that now is under Tillage. This Poore Piece but by the by obſerved, and practiſed would make good the Improvement promiſed, conſider it well and be convinced, or reply.

One Aere brings forth as much Corne as three.

Fifthly, if you conſider that all your Common Fields were never under Tillage neither, As great part Slades and Hade wayes, and a great part Meadow, and much and many Balkes betweene each Land, and many high wayes, and ſome Com-

commune of Paſtures and Leayes left for keeping Beaſts or Sheep upon, all which will containe one third part as I conceive, if not neare halfe in ſome places, not under Tillage but waſt Lands, Certainly I conclude there may be as much Corne got by Ingenuity upon this leſſer quantity of Ground, and much more being incloſed, than upon it all in Common; And that there cannot be any deſtruction of Tillage upon all theſe Waſts and Grazed parts which ever lay to Graſſe, and no Tillage was upon them, ſo that I muſt clearly conceive, were one third part upon all Encloſure allotted out or covenanted to be kept conſtantly in Tillage, though I adviſe not to keep the ſame third part alway in Tillage, but ſometimes one part, and ſometimes another, all making up one juſt third part, would raiſe as much Corn, as all did in Common.

And laſtly Encloſure cannot deſtroy Tillage the Staffe of the Country, becauſe it ever yeelds moſt profit, nor will, nor need all be converted to Paſturage: *Cain* and *Abel* were borne and planted together, and ordained to live together, and if there were any danger of one deſtroying the other, Tillage is likelyer to deſtroy Paſturage, becauſe *Cain* ſlew *Abel*; but without all feare the Ploughman and the Sheepheard may doe beſt together in a Commonwealth.

CHAP. XIII.

Sheweth the Excellency of Tillage, and the great Profit thereof, and the great Advance is made out of severall Enclosed Countries beyond Champion, as also the great Improvement of Heaths, Moores, and Forrests, which will dismisse those needlesse feares of overthrowing Tillage.

Tillage great profit.

NOw Tillage yeeldeth the greatest profit to Land-Lord or Occupier, study especially the *Good Husband* to convert thy Land to the best Profit, And that is held and maintained by all men to be by Tillage, else why doe men give double Rents to Till and Plow, above what they doe to Graze, and if thou art not yet satisfied, consider but the Wood-Lands who before Enclosure were wont to be releeved by the Fieldon with Corne of all sorts, And now are grown as gallant Corne Countries as be in *England*, as the Westerne parts of *Warwickshire*, and the Northerne parts of *Worcestershire*, *Staffordshire*, *Shropshire*, *Darbyshire*, *Yorkshire*, and all the Countries thereabouts, and all the Chalk Countries both South and West-ward.

Also consider the Chilterne Countries, and you shall finde, that were it all Inclosed men would Plow little or no whit lesse than now they doe, becaus nothing else nor no way else would yeeld the like Advance.

Consider *Hartfordshire*, *Essex*, *Kent*, *Surry*, *Sussex*, *Barkeshire*, *Hampshire*, *Wiltshire*, *Somersetshire*, and all the rest, All which not

not onely raise Corne for themselves but to supply that great City that Spends as much as all these Countryes and far more: And yet no parts of *England* set at greater Rates or makes greater Advantages by Grasing, and yet the greatest part thereof upon Tillage and Corning. And what Country not almost though Incloſed, yeelds the greatest profit by the Abundance of Corne produced; But if all that I have said be not enough I have enough I am sure before I have done.

As for your Heathes, Moores, and Forrest Lands, I shall onely speake thus much, That vast and Incredulous are their Capacities of Improvement in generall, refering the particular wayes of Improvement of every sort, and differing natured Land, as they fall in the fourth or sixt Piece of Improvement, to avoyd prolixity, because the very same Ingredients, Compositions, and Directions, are sutably and naturally Applyable to these Lands, as to those to which they are prescribed.

Therefore I onely say that all Interests in these Commons, or Rights of Common Pasture, upon any of these Lands may without Prejudice to any particular Interest, be advantaged and much Improvement made to the Publique; I speake not to inright the Usurpers of right wrongfully maintained, or Oppressors of any other mens Rights, I desire that Right might onely run in its proper Channell.

Onely Right in Commons, not Vsurpers I speake to.

First in generall by the same Method of Encloſing, held forth in this third generall Piece of Improvement, touching Common Field-Lands, if thereto, before Encloſure you doe but adde the Method or Drought of first casting out your Lands, and plotting them into such Plots and Formes, so that where there is, or may be a Capacity of bringing thy Land under any good Streame, or Land-flood, be sure to cast it for Meadowing, having drawne one Master Levell floating course throughout thy whole Plot of Encloſure, which may also serve as thy first devision; and to carry thy water along also to flow thy Meadowing thou shalt make all under it fit, that thou mayst not loſe that Opportunity now at first, (which after divisions made cannot be had) of so

At the first Encloſing of any Common, how to cast out Land to the greatest Advance.

great an Improvement, at so small a Rate, now at thy first contrivance thou mayst cast it under, and then cast out all thy Lands, according to the most suitableness of them, all to such Improvements, they lye under, and then to the Conveniences of each mans Right and Interest, and the greatest Advancement upon these Inclosures will be two.

Two Advantages of this Enclosure.

The first giving all Ingenuous men a Capacity to Plow, and Tilll what they please thereof, which will raise a double, or treble Advantage, as to Grazing, and a Tenfold greater Advance as to Common of Pasture (which to some is worth nothing at all, because of their remoteness, to others but little, because of some great Oppressor, nearely and neatly seated upon the Commons, that drives others from it) and to none what it may be, as by right, when he may use all his Parts, Purse, and Experiences of Husbandry at his owne pleasure by improving it; And it is and never was otherwise seene, that men would ever joyne together in one body, to use their utmost to improve any of these Lands to the best Advantage, for though Common of Pasture is mens owne Inheritance, and every man not knowing his Lot, or Portion, how rarely will they ever joyne or agree therein? although they are all perswaded of a probable great Advancement, yet one sayes, I shall not have so great an Advantage by it as my Neighbour; and another he believes it will be good for present, but it will not last; and an another sayes, he hath no reason to beare so great a proportion of Charge, though he have as much Land, yet he's not capable of so great an Improvement; & another saith, I could be well content to helpe on any publique worke, if otherswould, but for me to bestow cost and improve my Land, or commons, for others that will bestow none to eate and bite up my cost; much discourageth him; & indeed there is some Reason for his backwardnesse; and a thousand Excuses and Cavils there must be, which though a wise man may easily answer, yet never convince their Judgements, for it hath ever been so since their dayes, and their Fore-fathers were as wise as they, and they cannot be satisfied, let it alone and wee'l take the present profit it yeelds, and there is an end of their Improvement.

Cavils against Improvement in Common.

And

And here ile give you a Preſident, which though it might as to the nature of it, have come in more ſeaſonbly in the diſcourſe about common Field Land, yet here it is very naturall alſo, both as to the end I bring it for, and for the diſcovering a Capacity of vaſt Improvement, both upon it ſelfe, and upon all other Lands of that nature.

A Preſident of great ſtore of loſt Land under puddle hill capable of Improvement.

There are many hundreds if not thouſands of Acres of Lands neare *Dunſtable*, in a Valley under *Puddle*, or *Chalke-Hills*, juſt under the bottome of the Hills (an eminent place knowne well to moſt) which I believe runs both wayes farre, but on both ſides the Rode-way to *Coventry* and *Weſtchester* the Land lyeth, with a little Brooke, or ſtreame running through it; All which Lands if you obſerve them above halfe the yeare lye full of water, if not under water, and I believe is worth about five ſhillings an Acre, I am ſure abundance of it is not worth three ſhillings, and ſome not worth two ſhillings an Acre, which if my Judgement faile not, may eaſily be drayned, and laid ſo ſound and wholſome, which were but that done as it ſhould be, or but according to the ſecond Piece of Improvement, and the directions given in the ſeventh Chapter, treating of drayning, I dare uphold one Acre would be as good as divers now are in many parts of it, but then ſhould you alſo by the benefit of that Brooke, and all theſe gallant rich Land-flouds that iſſue from the Hills on one hand, and from the Vale eſpecially on the other hand, take the advantage and benefit of them alſo, and according to the firſt Piece Improve it by Floating, which may very feazibly be done according to the direction of the fourth, fifth, and ſixth Chapter, whereby it may be Improved to its utmoſt. I verily believe it would not onely make good the utmoſt extent of my Improvement promiſed, but will afford Hay ſufficient to ſupply all thoſe Barren parts, and that as good againe for the nature of it, if not thrice ſo good as now it is, Inſtance this place the rather, becauſe it is ſo obvious to every one, and ſo well knowne to moſt, and this offer of Improvement was once tendred to them, who could not agree therein, but made many of the Objections aforeſaid, although it was offered them to be

An offer made once to have made good the ſame.

done at anothers cost and charge, and they to have runne no Hazzard, but to have come into so great an Improvement paying the cost and charges, if the designe had taken after they had seen it wrought unto their hands: but there are a thousand, and ten thousand Acres up and down the Nation, some yeelds more, and others lesse hopes of vast Advancement, and all great enough if men would put them upon tryall, and great and vast quantities of Land in many Forrests, Common Fields, and other Heaths, Wasts, Moores, and other Commons, subject to the greatest Improvements at little charge, which will never be done till men know their own.

2 Advantage of this Enclosure.

And were every mans part proportioned out to himself, and layd severall, it would so quicken and incline his spirits, that he would be greedy in searching out all opportunities of Improvement whatsoever the Land is capable of; As by Lime, and Marle, Muck, Soyle, Marle, Lime, Earth, Chalke, and Mud, &c. With many other wayes, (all which men will infinitely more pursue when they know their own, then while it lyes at randome; And a Monarch of one Acre will advance more profit out of it, than he that hath his share in a hundred Acres in common) which will more naturally fall into the next Piece and there shall be particularly handled, whereby great store of Corne of all sorts (where now not one Grain is Tilled) may be gained, which raiseth Straw, Stover, and Fodder, abundantly for raising Soyle, Dung, or Manure; An old, and the onely infallible, and undeniable meanes to advance any Land whatsoever. I shall digresse a little, because all men talk of Husbandry, and good Husbandry too, and especially of much excellent Husbandry near and about *London*, where Soyle is so plentyfull, that halfe of it is scarce used, though so much needed, and so unspeakably advantageous, and yet so few practise Husbandry to purpose, though under such great opportunities, but few practise to purpose, else what meanes all those Barren Lands (though not Common Lands) lying within some two Miles, other three, foure, five, or six of the great City (where all men are said to be the most gallant Husbands of

Ill husbandry discovered along the River Thames both wayes much barren Land neat London.

the

the Nation) to lye unimproved, all Heath, or Ling, or Broome, not worth three, foure, or five ſhillings an Acre; ſurely were there either Soyle to be had at *London* for Mony, as indeed there is enough to be had without; nay in many parts men may have Money to carry it away, elſe were there a River to Barge it up and down upon, men would Improve it to great worth; Many hundred, if not thouſand Acres in *Eſſex*, *Kent*, and *Surrey* are neglected; certainly Land is worth Money, and Money enough too (if I be not miſtaken) about *London*; And then by theſe meanes when the ſame ſhall be layd down to Graze, obſerving but the particular Directions aforeſayd, it ſhall feed, and fat, where before it kept but ſtore Cattell alive; much more might herein be ſayd, but I'le ſay no more, for if the Preſidenting theſe Experiences will not ſatisfie and abaſh the Oppreſſor, I am ſure I ſhall ſhame my ſelfe by my Prolixity, and therefore I'le ſope the Black-more no more, untill he manifeſt his offence at what I have ſayd, by way of returne in the ſame kinde, but if he delight more in Rime than Reaſon or Experiences, Take Mr. *Tuſſer* ſpeaking in his Husbandry of the great Advantages betwixt Encloſure and the Champion Countries, and betwixt Slothfulneſſe and Ingenuity, and I will give it thee in his own Phraſe, which I conceive may pleaſe thee better, and he ſpeakes very good Reaſon alſo by his Rimes.

By Maſter *TUSSER* 106. *Pag.* *Chap.* 52.

A compariſon between Champion-Countrey and Incloſure.

THe Country Incloſed I praiſe,
The other delighteth not me,
For nothing the Wealth it doth raiſe

To

To such as Inferiour be.
How both of them partly I know,
Here somewhat I minde to show
Their Swineheard that keepeth the Hog,
Their Neatheard with Curre and with Horn,
Their Sheepheard with Whistle and Dog,
Be fence to the Meadowes and Corn.
Their Horse being ty'd on a Balke,
Is ready with Thiefe for to walke
Where all things in common doe rest.
Corne-field with the Pasture and Mead,
Though common ye doe as the rest,
Yet what doth it stand you in stead?
Their Commons as Commoners use,
For otherwise shalt thou not chuse.
What Laire much better then there?
Or cheaper thereon to doe well?
What Drudgery more any where?
Lesse good therefore, where can ye tell?
What gotten by Summer is seen,
In Winter is eaten up cleane,
Example by Lieceſterſhire,
What Soyle can be better than that,
For any thing heart can desire?
And yet they want ye see what,
Mast, Covert, Close, Pasture, and Wood,
And other things needfull is good,
All those doe Inclosure bring,
Experience teacheth no lesse,
I speake not to boast of the thing,
But onely a truth to expresse.
Example (if doubt you doe make)
Of Suffolke *and* Eſſex *goe take,*
More plenty of Mutton and Beefe,
Corne, Butter, and Cheese of the best,
More Wealth any where to be briefe,
More people more handsome and prest
Where finde yee? Goe search any Coast,

Then

Than there where Incloſure is moſt,
More worke for the Labouring-man,
As well in the Towne as the Field,
Or therefore deviſe (if you can)
More profit what Countrey doth yeeld.
More ſeldome where ſee yee the Poore
Goe begging from doore to doore?
In Norfolke *behold the deſpaire*
Of Tillage, too much to be borne
By Drovers, from Faire unto Faire,
And other deſtroying the Corne,
By Cuſtome, and Covetous Pates,
By Gaps, and opening of Gates.
What ſpeake I of Commoners by
Withdrawing all after a Line,
So noying the Corne as it lye,
With Cattell, with Coneys and Swine?
When thou haſt beſtowed the coſt,
Look halfe of the ſame to be loſt,
The flocks of the Lord of the Soyle
Doe yearely the Winter Corne wrong,
The ſame in a manner they ſpoyle,
With feeding ſo low and ſo long.
And therefore that Champion Field
Doth ſeldome good Winter Corne yeeld.
By Cambridge *a Towne I doe know,*
Where many good husbands doe dwell,
Whoſe loſſes by Loſſels doth ſhew,
More here than is needfull to tell.
Determine at Court which they ſhall,
Performed is nothing at all,
The Champian robbeth at night,
And proleth and filcheth by day,
Himſelfe and his Beaſts out of ſight,
Both ſpoyleth and maketh away,
Not onely thy Graſſe, but thy Corne,
Both after, and y'er it be ſhorne,
Peaſe bolt with thy Peaſe be will have,

His houshold to feed and his Hog,
Now stealeth he, now will he crave,
And now will he cozen and cog.
In Bridewell *a number he stript,*
Lesse worthy than Thiefe to be whipt.
Lord if you doe take them what stirs?
How hold they together like Burs?
109. p. 160. *For Common these Commoners cry,*
Incloſing they may not abide,
Yet ſome be not able to buy
A Cow with a Calfe by her ſide;
Nor lay not to live by their worke,
But Theeviſhly loyter and lurke.
The Lord of the Town is too Blame
For theſe, and for many faults moe,
For that he doth know of the ſame,
Yet lets them unpuniſhed goe.
Such Lords ill Example doe give.
Where Varlets and Drabs ſo may live,
What foot-paths are made, and how broad?
Annoyance too much to be borne,
With Horſe and with Cattell, what road
Is made through every mans Corne?
Where Champians ruleth the roſt
There daily diſorder is moſt,
There Sheep when they drive to waſh,
How careleſſe their Sheep they doe guide?
The Farmer they leave in the laſh
With laſſes on every ſide;
Though any mans Corne they doe bite,
They will not allow him a mite.
What Hunting and Hawking is there,
Corne looking for Sickle at hand?
Acts lawleſſe to doe without feare,
How yearly together they band?
More harme to another will doe,
Than they would be done ſo unto.
More profit is quieter found,

Where

Where Paſtures in ſeverall be,
Of one ſilly Acre of ground,
Than Champion maketh of three.
Againe, what a joy is it known,
When men may be bold with their own?
The tone is commended for graine,
Yet breade made of Beanes they doe eat,
The tother for one loafe hath twaine,
Of Meſlin, of Rye, and of VVheat.
The Champion liveth full bare,
VVhen Wood-land full merry do fare.
Tone giveth his Corne in a Dearth,
To Horſe, Sheepe, and Hogs e'ry day,
The other give Cattell warme barth,
And feeds them with Straw, and with Hay.
Corne ſpent of the tone ſo in vaine,
The tother doth ſell to his gaine.
Tone bare-foot, and ragged doth goe,
And ready in Winter to ſtarve,
When tother yee ſee doth not ſo,
But have what is needfull to ſerve.
Tone paine in a Cottage doth take,
When tother trim Bowers doth make.
Tone layeth for Turfe and for Sedge,
And hath his wonderfull ſuit,
VVhen tother in every hedge
Hath plenty of Fuell and Fruit.
Evill twenty times worſer than theſe,
Incloſure quickly would eaſe.
In VVood-land the Poore men that have
Scarce fully two Acres of Land,
More merrily live and doe ſave,
Than tother with twenty in hand.
Yet pay they as much for the two,
As tother for twenty muſt doe.
The Labourer comming from thence,
In VVood-land to worke any where,
I warrant you goeth not hence

To work any more againe there.
If this same be true (as it is)
Why gather they nothing of this?
The Poore at Inclosure do grudge,
Because of abuses that fall,
Lest some man should have too much,
And some againe nothing at all;
I order might therein be found,
What were to the severall ground?

Consider well many Solid demonstrations of Truth in these particulars, he speakes very much Reason and as much Truth, his observations are very good; nor is it the single opinion of Mr. *Tusser* and my selfe, but of all that ever I yet saw or read of these subjects of either good husbandry or the best way of Improvements of Lands, but ever advised and perswaded to this, as ever you would study your owne, the Common-Wealth, but especially the good of your Posterity, indeavour & prosecute such an Enclosure that is not nor can appear to be any particular soules hindrance. Tis true I have met with one or two small Pieces, as M. *Spriggs*, and another whose name I remember not, that write against depopulating Inclosure, with whom I freely joyn and approve, such as former oppressive times by the will and power of some cruell Lord either through his greatnesse or purchased favour at Court, or in the Common Courts of *England*, by his purse and power could doe any thing, inclose, depopulate, destroy, ruine all Tillage, and convert all to Pasture without any ony other Improvement at all, lay Levell many honest families to the ground, dispeople a whole parish, and send many soules a gooding, a cursed horrible oppression, which for my part I would it were Fellony by the Law, which I thinke really is no better, which hath brought men to conceive, that because men did depopulate by Enclosure, therefore it is now impossible to enclose without Depopulation, but against Enclosure it selfe, meerly to convert it from a generall promiscuous Common age, to a division or distribution of every ones share and Interest therin to his own particular possession, use, and occupation, to mannage, husdry

bandry, and Improve as he ſhall like beſt, both for manner, time and charge, I never yet did ſee nor read any to avouch the ſame, but ſhould be very willing to meet with ſuch an Antagoniſt, for whom I am prepared, and will if God pleaſe to give opportunity in mild and loving way endeavour to convince him of his raſh miſtake: but ſhould any man take offence at Encloſure as of it ſelfe, as I verily believe none doth, yet at ſuch a way or Method of Encloſure as is here held forth and diſcovered, that provides as much for the raiſing and increaſe of Corne and all Graine, as for ſupply of Paſture and Meadow, and provides for all Intereſts their proportionable Advantages, I hope very Doggs themſelves will not move a Tongue.

And as for old writers, ſo for new and late ones they all with one conſent encourage to Encloſure & Improvements, ſome affirming that the great benefit of the Sheepe their Wooll that Staple Commodity of *England* doth Imploy more people by farre on every Acre than by Corning, which may poſſibly be ſo too, but I am ſure that in a way of Improvement, which I hold forth, it muſt needs more advantage the Common-Wealth than lying waſte in common and unimproved. And if thou Peruſe Mr. *Hartlips* book printed two yeare ſince, wherein he handles it very demonſtratively, well worth thy reading, will confirme the ſame. And if thou wilt peruſe learned *Fuller* in his Holy ſtate, you ſhall ſee the Excellent advantages and Improvements may be made to all by an Encloſure without Depopulation, in the ſecond book 13. Chap. page 91. moſt Excellently handled and cleared.

See Mr. *Hartley* his legacy page 56.

Studie therefore the magement of all thy eſtate to the beſt publique Advantage, Husbandry all thy Lands to the beſt and greateſt benefit of the Common-Wealth, for in this way of Improvement thou canſt not poſſibly intending the publique good, but neceſſarily the greateſt good muſt follow to Poore, thy ſelfe and family.

Order therfore thy common Arable Lands, as they alſo may raiſe and produce their moſt plenty to all Concernments, and all Waſts, Forreſts, and Heathes, that they may produce

their great advantage, which being so old and restie, will yeeld forth Corne in great abundance, and after Pasture to double profit. Be not peevish, nor let not passion nor old customed corrupted Will prevaile against these Advantages, for he that Improves not all his Land to this end, the raysing plentie, and relieving the miserable, answereth not the ends, wherefore thy selfe and all thy Lands were given, as before I hinted. I have no more to say to thee, but to intreat thee to remember that passage of the Wise Man (*viz*) *The thoughts of the diligent bring abundance*; And if thou wilt be yet unsatisfied, be so still.

The

The fourth Piece of Improvement ſhewes how to Plow and Corne old Paſture Land ſo as not to Impoveriſh it, and double the Improvement of it for a Time, and afterward to better it for ever in a way of grazing; and will be as a medium to allay the ſecond Extreme; and will diſcover that Corne ſhall ever be the predominant profitable ſtaple Commodity in the Nation: and ſheweth many particular wayes of Improvement of other ſorts of Lands.

CHAP. XIV.

THere is a ſecond Extreme alſo which men wedded to their ſelfe profit hugg in their very boſome, which is ſo much to their hearts content, that they never looke what may make moſt profit to the Publique, or good of the Common-wealth, themſelves, or Poſterity; He is ſeated in way of Feeding and Grazing, with a conſtant Stock of Breeding, and let his Land be fit for one, or fit for another uſe, he matters it not, he hath received a Prejudice againſt Plowing, partly becauſe of the Toyle and Charge thereof, and partly becauſe, as aforeſaid, ſome men have Plowed their Land ſo long

long as they have Impoverished it much, And some men so long as it is possible it may be many yeares before it Soard Compleatly, and therefore let it be Dry or Moyst, Sound or Rotten, Rushey or Mossey, Fenny, or run over with a Flag Grasse, or Ant hills, Mossure, or wild Time, let it keepe more or lesse, hee'l not alter, tell him Sir it will yeeld abundance of gallant Corne to supply the whole Country, and raise great Summes of Money to your Purse, and afterward (if you Plow Moderately) it may keep as many Cattell, nay more, yet nothing takes with him, he will have no Enclosure Plowed by no meanes; yet seriously weigh these ensuing particulars, And then use thy owne will and pleasure.

A second sort of Courser Land the only Land for Plowing.

But to make good my promise herein; I must first premise, that my Designe is mainely upon a second sort of courser Lands, betwixt twenty shillings an Acre, and ten shillings or a noble, out of all which will come a great Advancement to no prejudice at all, and is a member of one of the six Pieces of greatest Advancement promised. Although the best sort of Land of all will yeeld the greatest profit, yet not without some seeming little Prejudice to it, And also this will best continue and hold his beauty, and strength, and Improve upon Grazing rather than lose, which the best sort wil not. And of this best sort of Lands with the Improvement to be made thereon very Considerable, I shall also speake under the fixt and last Piece of all: And shall now set forth how the Plowing of all such Lands, according to the Designe projected, which shall be a supply or filling up, and running over of the measure of plenty of Corn in case Inclosure should decrease it (which I am confident upon the consideration of the aforesaid Reasons thou canst not Imagine) and so remove that Extreme also. In which Projection I shall tell thee, that if thou wilt follow the Rules prescribed, thou shalt double the prizes of thy Lands for the present time of Plowing, and after lay it downe better for Grazing than thou tookest it up to plow, onely consider that of this second sort, there be three natures.

Frst, sad and moyst strong Clay and cold.
Second, Mixed with divers Earths.

Third

Third, Warme, Sandy, or Gravelly.

The firſt natured Land advanceth it ſelf moſt by Tillage, yet raiſeth Corne in abundance alſo, but the two other latter natured Lands advanceth not ſo much in it ſelfe, as in that wonderfull increaſe of Corne it yeeldeth to the Common-Wealth, I verily believe that Lands of theſe latter natures are as fruitfull and kinde for Corne (eſpecially if they be reſty) and for foure yeares may produce as much increaſe to the Strike or Market as that Land that is as Rich againe or twice as Rich, for as the Corning Land may poſſibly ſometime be too good as alwaies too bad, I had farre rather make choyce of a middle ſound warme Land, than of the richeſt and fatteſt that is, for this will yeeld it ſelf and hurt more to the Corne than the other, and yet this alſo may be bettered with wiſdome uſed in the Ploughing for Grazing alſo.

The middle ſort of Clayeſt ſtrong Land in advanceth it ſelfe by Tillage.

The warme lighter Land advanceth moſt in Corne to the Common-wealth.

Firſt therefore conſider the nature of this firſt ſort of Land, and the way of Husbandring it, to inable it to produce the promiſed Improvement; And ſo I begin with that which is of a pure Clay, or of a little mixed nature either with Sand or Gravell, and yet is of a cold temper, and ſo is neither ſo wholſome for Cattels lodging, nor ſo fruitfull for their Paſturing; Which ſort of Land is many times overrunne with Ant-hills, which are beſt deſtroyed this way, being opened, the Soard taken up, and the Coare taken out, and ſcattered before the Plough, will make all the Land Plough the better and alſo lye better, and the Mould will help a little all the parts of the Land they are ſpread upon. And Ruſhes and Moſſe in abundance, may many times ſo over-run the Land, which are ſo thick and noyſome, that they not onely hinder the Earths naturall fruitfulneſſe, but the Ruſhes are ſo thick and high in many Paſtures, that the Sheep many times make them for their Refuge, to preſerve themſelves from the heat, that oft-times they are ſheltered ſo long by them untill they be loſt by the Manes Maggots, or Vermine; A great prejudice to the Grazier, or Breeder; All which is certainly occaſioned by the Moyſtneſſe, and Coldneſſe of the Lands, which will no way more certainly and

How to bank Ant-hills moſt ſpeedily.

The beſt way to deſtroy Ruſh or coldneſſe in any Paſture.

Advantagiously be removed but by Ploughing these Lands, which course although by many men it be thought an Impoverishing of the Land, yet I absolutely deny the same, and Affirme both from mine own Experience, and the Practice of those that have made tryall thereof, that it shall most wonderfully advance the same for present, and future; Over-Ploughing indeed weakens Land, Extreames on either hand are dangerous, and destructive; Food and Bread sustaineth Nature, but Gluttony destroyes it; Wine nourisheth the heart, but Drunkennesse drownes it; And as over Tilling and forcing out the heart is worst, so I say, not then to Plow when the Land is runne to Mosse, and to these corruptions, is no lesse bad: And being done with wisdome and moderation is farre more advantage then not to Plough; And this my self have offered familiarly for Lands of this nature, worth, and quality, to give a Ploughing or double Rent for the same according to his naturall worth for three or foure yeares, but not above, as hath been conceived the Land hath been able to beare; And then after Ploughing the very first yeare to give the old Rent, and take a Lease for Tenne, or Fifteene, or Twenty yeares at the same rate, whereby let Ingenuity Judge, what Prejudice this may be possibly; For the time of Ploughing the Lands may yeeld double Rent, some more, some Rent, and halfe Rent, and some one third part more than old Rent; All which I conceive is a great Advantage, with another secret Advantage interwoven with it, as an Addition to the State, which is the raising of a great quantity of Corn to the use of the Common-wealth, The setting of many Poore on worke, The raising Straw, which wintering Cattell with, may raise such abundance of good Manure, Dung, or Soyle, as may Inrich a great part of the same, or some other Lands; and were there no other advantage but helping the Common-wealth herein, I hope no honest publique spirit would oppose it, many Lands lying under this Capacity lye in the South part of *VVarwickshire* and *Worcestershire*, *Leicester*, *Nottingham*, *Rutland*, some part of *Lincolneshire*, *Northampton*, *Buckingham*, and some part of *Bedfordshire*, and in most part of the Vales in *England*, and very

Moderate Tillage must needs advance Land.

Advance for Ploughing, and the old Rent the first yeare after.

An offer made of making good a Lease after Ploughing of old Rent, and a great advance in Ploughing.

very many parcels in moſt Counties of this Nation ; And this I ſay againe, doe but obſerve my Method, and ſtrictly trace my Inſtructions, and purſue them all along, I dare make it good upon moſt Lands, except it be upon that which is a harſh binding churliſh nature, which will alſo admit of a good Improvement though not ſo good, eſpecially when it ſhall be over-grown with the aforeſayd Annoyances.

CHAP. XV.

Shweth the manner of Ploughing, and working Lands to ſo great Advance, with two Incredible Preſidents of Advance.

THere is a parcell of Land in *VVarwickſhire*, near *Stratford* upon *Avon*, that is Oaded every fourteene yeares, and Corned divers yeares after that; and ſo there may be many more Parcels alſo beſides this I ſpeake of, and ſo I know there is, and after that fourteene years reſt and Grazing, Oaded again and Corned alſo : So there are ſome in *Northamptonſhire*, *Buckinghamſhire*, and many other parts will doe the like; And ſo runs round, Grazing-fits for Ploughing and Corning, and Corning-fits for Grazing ; A moſt gallant opportunitie; Doubles the Grazing-rent, while under Corning, and more under Oading; And Grazeth again immediately at a very conſiderable Rent, and might doe the firſt yeare at old Rent, and ſo forward, Would they Plough but three or foure yeares according to my direction, but they Plough five, ſix, or ſeven ; Such a Method would pleaſe me gallantly, advance the Common-wealth exceedingly ; and prejudice whom, I would faine know : Abundance of poor ſet on work ; Abundance of Corne raiſed ; Abundance of Straw which ſpent and fed upon the Land, ſhall make that

Stratford upon Avon Preſident.

up againe what ever the Ploughing fetched out: Doubles Rent and more, foure or five years in one and twenty: And so every Age neere fetcheth in the Purchase; And the Land where it was, and would be as rich as it was, if it be not (my directions obserued) a great Estate raised out of nothing: Why not thus in a thousand other parts of this Nation, as good Land, and better, and as suitable to this Advance, and not improved to it.

O Sloth! stand by, and let Ingenuity try a Trick or two more, and wonder at thy own Ignorance and Weakneſſe, and now see how to work it.

The manner how to Plow such Lands.

Secondly, consider thy Land how it lyeth, whether round with Ridge and Furrow, then use your own discretion for the manner of Ploughing; for the first yeare however, Plough it as well as you can possibly, both clear from Balkes and Slips, and of such a stitch or depth as the Land will bear; however goe not under the true and naturall soyle of the Earth, neither Plough it too thick, for that will be a great prejudice to your second Ploughing, because your Furrows will rise most hard and stubborne, and so moile both Teames, Work-men and Servants, as is incredible. But if it be Lands and great Balkes together, then for the Lands Plough them as you please, that is, whether Ridge-Are, or Cast them, but for your Balkes before you, Ridge them all.

Mow the Rushes.

And although it will ask paines, cost and hot water, yet faile not herein: And though the Rushes be thick and strong, yet be not discouraged; Mow the Rushes in the beginning of Winter, as low as you can possibly, and then you may with paines and patience, a good Teame, and good Ploughs with sharp Irons, all made true, sharp, and smooth, doe it with incredible dexteritie; faile none of these directions, you cannot conceive the wonderfull advantage in this exactneſſe; And were it so the Land were such as there must be required as much cost and paines with the Spade, as with the Plough? I would bestow it, and never question how it shall answer the same: For, say the cost be extraordinary, and say one Acre cost thee as much overcomming it, and laying it round, sound, and faire, as usually thou or others bestow on

Especially directions for plowing.

two

two or three Acres; Yet what is that to the fruit or profit it may produce? I dare ſay one Acre of Corne thus throughly husbanded may be worth two Acres, nay three ſlubbered over and done many times, as moſt men commonly do therein; And what is it to lay out five ſhillings or a noble extraordinary in every Acre in the Husbandry, and reap it by the Pounds in the Crop, as I dare ſay you ſhall in the two firſt Crops, which are the onely Crops requiring ſuch paines and exactneſſe. I could tell thee an Experiment if thou durſt beleeve it, 'tis this; I once held a Piece of Land worth nine ſhillings an Acre, and no more to a Graze; I gave fifteene ſhillings to Plough, it was great Lands, as great Balkes betwixt them, full of your ſoft Ruſhes, and as high ſome of them as any ordinary Beaſt, and lay very wet; The Land conceived by me not able to beare Barley, nor never would, it was ſo Weak and Barren, ſo Cold and Queaſie: And the neighbours very able Husbandmen round about ſo diſcouraged me (out of their love unto me) as that they defired me to forbear Tillage of it, becauſe it would never anſwer ordinary coſt beſtowed on it, nor be worth an old Grazing-rent to Plough, and that they cleared to me by very cleare Evidence as they conceived, affirming, that the Land next unto it, but a hedge betwixt, which was farre better Land, (and indeed ſo it was very neare as rich again) husbanded by very able husbands, the beſt in that Country; And that Land good Barley-Land, yet never anſwered the paines and coſt beſtowed, yet I reſolving to make a full triall thereof, I ſet upon it according to the preſcription aforeſaid, Each Acre Ploughing and Harrowing, Spading and Dreſſing (for indeed I made Harrowes on purpoſe alſo) of divers Sizes, it coſt me about fifteene or ſixteene ſhillings an Acre the two firſt Crops the very Dreſſing of it; And for theſe Crops, being but of Oates, I could have had five pound an Acre, being offered it by an Oatemeale-man of himſelfe, though never asked, growing upon the ground; Nay ſix pound an Acre, if I would have ſold it, which is a vaſt Rate for Oates in the middle of the Nation; And indeed I found the ground ſo poore, that it would not beare Barley, for I tryed ſome Acres

Experiment of Plowing the ſecond ſort of Land and the fruits of it.

A Preſident of the fruit that came of poore Lands worth but nine ſhillings an Acre.

of the best Land in it, but it was not worth an Acre of my Oates, and after Ploughing I gave the old naturall Rent as it was ever set at or really worth, and that for many yeares, and the Land is better, lyeth sounder, warmer, and both yeelds more Milke, Summers as many Cattell, and Winters farre more, and feeds better than it did before, without any other cost bestowed, and the very first yeare I layd it downe after Ploughing, it kept me more Cattell and better than ever it did before, and will continue better for it for ever after.

CHAP. XVI.

Sheweth the best, and most advantagious way of Ploughing, and Husbandring Lands, so as most to Advantage it, in laying downe Land to Graze, to make good the Improvement promised, and not to over-plough, as you tender the losse of your Land.

To lay open Furrows clear is very good.

TO this end be sure to lay your Furrowes open, and cleane scoured up, and capable to receive and carry away all your standing water, or soaking moysture from your Lands, and be sure so to Plough your Lands as you may cast your Lands into severall Furlongs, that you may have one Furrow or Drayne run into another, and that next into another, and so into the Master Trench, which if it cannot be made deep enough with the Plough, let it be done with the Spade substantially; And so from one to another, to carry away the Water, that it may neither annoy your Corne throughout your Field in any Furlong, nor your Land when

when you come to lay it downe, and then when you have Plowed your Lands, where in the more truth and exactneſſe you obſerve therein, the more fruit expect.

And when you come to ſowing your Lands, you muſt get very ſtrong weighty Harrowes (if you would doe it indeed) and not ſlubber it over (as moſt doe) long tined and ſharpe, and either they muſt be ſo weighty of themſelves, that they may worke a gallant ſtrong Teame to draw them, or elſe ſo loaden with weight, that you teare up rough uneven places, and raiſe good ſtore of Mould, which is a marvelous great Advantage to the Corne; as for the ordinary way of Hilding Land as moſt doe, is Reproveable, and then with two or three ſorts of Harrowes, each Harrow having his Teeth, or tines thicker than other, which will ſo curiouſly and certainly cover your Corne that you will have little or none lye uncovered, but well moulded, which will have ſuch ſtrength, and heart unto it, as by Gods bleſſing you may expect a Crop anſwerable to your coſt beſtowed, and far greater.

What Hardneſſe and Harrowing is moſt advantagious.

The next direction is, that as I cry up Plowing, as a ſoveraigne meanes of a great Advancement, ſo I alſo as much decry Over-Plowing, or the Plowing of Lands as moſt doe, ſome Plow as long as it will beare any Corne, and others as long as it will beare good Corne; And others they Plow on any faſhion, lay their Lands, as though they were overrunning them, both to Corne and Graze, and when they lay it downe, ſome lay downe ſound warme dry Land very high, ridge and furrow, and ſmall Land too, very prejudiciall to their Land and themſelves too, and are juſtly reproveable; others lay down ſtrong cold Land flat unopen'd, ſome part Plowed, ſome unplowed, full of balkes, holes and hils; as if they would ſecure or ingroſſe all the coldneſſe and Venom of all the water and hunger that is either naturally upon it, or that falls upon it, or paſſeth by it; they matter not after what manner they leave it, nor after what Graine, I therefore preſcribe onely three or foure yeares to Plow unto this ſort of Land, and to raiſe it every yeare not leſſe becauſe the Ruſh, Filth, and Earth will not be rotted, nor well compounded; nor the nature of the Land changed with fewer Tilths

Over-plowing cryed downe and reproved

Reaſons why but three or four yeares are preſcribed for Plowing old Paſture Land neither more nor leſſe.

Tilths, nor the Lands well brought to a good height, roundneſſe, and drineſſe in leſſer time; for if it be cold Land, all that can poſſibly be done will not lay it high and dry enough, nor the Mould wrought to her perfect tenderneſſe, and true Mixture, whereby it may yeeld more fruitfulneſſe; but if the Land be very rich of nature, and not well wrought, nor the Ruſh perfectly deſtroyed, nor the Lands brought up to a convenient height and roundneſſe, then one yeare more may doe well, which yeare ſhall yeeld the beſt Crop out of all queſtion, but will draw a little more from the ſtrength of the Land, then any of the other yeares did; and if the Land be in ſtrength, it may very little prejudice it, and therefore this I leave to every mans pleaſure, upon this Conſideration, and could wiſh that all men would ſo Plow, as mainely intending the Advance and Betterment of their Land, eſpecially Paſture Land, and no otherwiſe; For you were as good loſe ſome of your Inheritance (as you doe) in my opinion, Or as good loſe the Land which is but the Carcas, as the ſtrength and vertue which is the Heart and Life of it, for therein is the Common Advantage, when the Earth yeelds moſt increaſe, or fruit, and a little parcell yeelds abundance of fruit.

Laſt Crop may yeeld moſt Corne, but worſt for the Land.

To lay downe Land upon the Wheat, or Rie Stuble is beſt, and the reaſons of it.

Fifthly and laſtly, I adviſe to lay downe all Lands of this nature upon Wheat, Meſlen, or Rye Stuble, which will exceedingly thicken and Improve the Soarding, and if my Principles faile not, will raiſe as good a Soard in the firſt yeare, as after any Summer Corne whatſoever will in two and muſt do well for theſe Reaſons.

Firſt, becauſe it hath one halfe yeare more to Soard in, then after the Lenton Tylth, and ſo is ſomewhat Soarded before Oates, Barley or Peaſe are ſowne.

Secondly becauſe winter Corne groweth thin, long, and a ſtronger Straw, and gives more liberty to the graſſe to grow, and ſpread the Thicker, and the Soard will alſo be very Rich, and Fruitfull; I likewiſe adviſe to ſow this Land, as yearly as poſſibly you can, even as ſoone as your other Crop is ended, the ſooner the better, unleſſe the Condition of the Country very much oppoſe it, how ever the Earlier it is ſowed

ſowed, the better is the Crop like to prove in my opinion, becauſe theſe Graines of Wheat or Rie, &c. require the land to be in better Tillage than this can be: Therefore helpe it what you can poſſibly, by ſeaſonable and early ſowing, that it may have as much Summer as may be, and by all meanes Harrow in your Corne after it is Plowed; For this is more certaine to Produce a good Crop; And ſecondly leaves the Ground even, and ſmooth to Graze; yet forget not that your Land be left High, and Round, the Colder in nature the Higher and Rounder as aforeſaid, and each Furrow be Scoured up as cleanly as you can poſſibly; Theſe ſimple particulars really Obſerved, and Practiſed, will bring the Land to that condition that I ſhall make good what I formerly promiſed, and to this particular I ſhall ſay no more for preſent, onely this may be applyed to any of this ſecond ſort of Land, be it of what Mixture, or Compoſition ſoever, that is Banky, Moſſy, Cold and Ruſhy, and will have a proportionable effect promiſed; But if poſſibly you could run over a good part of this Land with Dung after you have plowed it before you ſow your laſt Crop, or ſo much as you could, it would produce a double advantage of the coſt beſtowed, towards the Soarding of it. And if after you have Reaped your laſt Crop, you could then run it over againe, with any quantity of Muck, or Compaſt, it might ſo nouriſh your Land, and that for many yeares after, poſſibly it might be neare as good againe upon the old Soarding, as it was before; for you would wonder how much good one Load of Manure doth upon the Land ſo Tender, Wrought, and Mixed, beyond what two or three Load will doe on old Soard, or old Paſture ſo Rough and Filthy; nothing will make you to beleeve this, but your owne experience. Let me prevaile herein (good reader) to make a tryall, it will be to thy benefit, be not an Enemy to Tillage, nor raiſing Corne to Poore, and Common-wealth, and if thou expect beter Satisfaction, take it from divine evidence and from the Concluſion of him that ſpake by Inſpiration, as well as from natural Experience.

The way of Sowing Land to be left after to Graſſe.

Dung laid upon the new freſh Turfe, works wonders.

When one Load of Manure will goe as far as two or three.

Prov. 12. 11. Prov. 28. 19.

He that Tilleth his Land, ſhall be ſatisfied with Bread, and ſhall have plenty.

Prov. 13. 23. *Much Food in Tillage for the Poore.* And if this satisfie not, carry this one Text (if thou canst remember no more) along with thee into thy Pastures, when thou art in thy greatest Glory.

Prov. 11. 16. Prov. 13 23. *He that withdraweth Corne, the People shall curse him, and a blessing upon his head that selleth it.* But he must get it first, and so we ought upon that Land as will most freely yeeld it, which I conceive is a maine end wherefore Thou and Thy Land was first created. Be not envious to thine owne good, nor wilfull to thine owne profit; I am much abashed to use so many words, to presse so plaine Simple Principles, though to be well knowne to all (and possibly they may be, better then to my selfe) but truly the little Practise of them, and the Scorne men carry in their Breasts to learne, and that Thirstinesse in me after the Common good, occasions all this Rudenesse, to see thousands of Opportunities so neglected makes me amazed.

CHAP. XVI.

Richest sort of Land. AND first for your richest sorts of Land conceived as good as Art and Nature can make them, yet consider the insuing Discourse, may hold out some Improvement to be made out of the same. As for your best Land of all, That by Husbandry Drayning, Seperating, cleering, Plowing, Soyling or some sort of husbandry or other was brought to this perfection, it was not in this condition naturally nor originally from the beginning, much whereof may be now cleare from Rushes, Mossinesse, Sow Thistle, Netles, Weeds, and Hemlocks and all other pelse: and onely bring forth pure Grasse, both thick and rich; this possibly may admit of little Improvement upon it selfe, but unto the Owner and Common-wealth this may yeeld above double profit for some yeares by moderate Plowing, and afterward returne so soone to his naturall fruitfulnesse, as that it shall yeeld his old Grazing Rent the first yeare, and so continue; But this Land being of all other the most subject to Abuse, and

and greater prejudice then any other Land whatſoever; And I am confident unleſſe the Preſidented directions contained in the fourteenth and fifteenth Chapter, be moſt punctually obſerved, it may ſuffer loſſe, therefore I muſt provoke no man to take the purſuance of them here, unleſſe any who is of ſuch a publique ſpirit, as rather deſires the Publique then his owne private Advancement; And for ſome other men when they finde ſo great profit, come in upon them by this or any other meanes, they out of a thirſty deſire of gain will Over-doe, Over-Plough, and ſo deſtroy their Land: for it is not Ploughing ſimply as aforeſayd, that impoveriſheth Land, but too oft Ploughing, and look you where you will generally throughout this Nation, and you will finde where any good Paſture is deſtroyed hereby, they have Ploughed Six, Seven, and ſome Nine, Ten, and ſome Twelve Crops together, which I approve ſo well, as I ſay it is a Loſing Extreame; And I wiſh it were Felony ſo to abuſe a mans Selfe, Lands, Poſteritie, and Common-Wealth; Alſo which Lands may be ſo many yeares before they come to a perfect Soard againe, as may loſe as much in Abatement of Rent before it come up to the old Rent, as they got in the Advance Rent by Ploughing. And yet if I affirm, that Mowing Land without Limitation, is as Impoveriſhing unto it, as Ploughing Land with Moderation; Eſpecially Upland Paſture, I ſhould not much miſtake; I am a greater Enemy to the one without Limit, than to the other with Moderation, and yet the one is cryed downe by all, and the other by few or none; Therefore my advice ſhall be, to Plough thy Land three, foure, or five Crops, if thy affections ſtand that way, and lookeſt at greateſt Profit, Sowing it firſt with Hempe, Oade, Coale, or Rape-ſeed, Madder, Licorich, or Sow ſuch rich Commodity that will ſo well pay for it, or ſomething elſe that better agrees with the rankneſſe of ſo gallant Land, which for divers of the firſt yeares will be ſo ranke, that Corne will fall Flat, and Dwindle, or Rot, and neither be kindly in quality, nor riſe to the ſtrike in quantity, as it will upon thoſe Lands after divers Crops taken, or upon leaner Land, and then after with Corne the laſt years; And if thou

Deſtruction of the beſt Land is by over-ploughing.

Moving Land a great Impoveriſhing.

Moderate Ploughing better then unlimited Mowing.

wilt but lay it down round, and even, upon the Wheat, Rye, or Meſlin Stubble Sowed in his proper Seaſon, obſerving ſome other few Directions, handled more at large in the aforeſayd Chapters, thou ſhalt not need to feare thy Lands Impoveriſhing or Abating Rent; It will produce ſo gallant and ſweet a Turfe, as will feed as well, and faſter than it did before, if not better: For my owne part, I doe affirme, That had I the managing it whilſt under Tillage, I would make good the ſame upon good Security; But as I ſaid before, uſe your own libertie, he that Ploughs not ſuch Land at all that yeelds its utmoſt ſtrength and fruit in Grazing, which admits of no Corruption or Degeneration, doth well: Becauſe the Nation will afford other Land enough, that ſtands in more need of this Husbandry to ſupply the Countries Corne; And alſo, becauſe many men hold it a great Diſparagement to Plough up ſuch gallant Paſture, from whom I doe very little or nothing diſſent in Judgement, yet he that (if by Ploughing) can Advance the Publique and himſelfe alſo, I dare not ſay but he doth better, yet neither much amiſſe; Every man herein pleaſe his own affections, where the Common-wealth is not eminently prejudiced.

Ploughing left indifferent upon the Richeſt Lands.

But for other wayes of Improvement of the Richeſt ſort of Land, I know little more worth Divulging, for either the Coſt and Charge expended will not produce an anſwerable preſent Advantage, or elſe the continuance and certainty of future hopes may prove doubtfull; Which uncertainties I affect not, onely take this remembrance with thee, that if thy Paſture be very Vaſt and Large, Leſſer Diviſions will ſet the dearer and better, and are every mans money for Conveniencie, when greater are bargaines for few men, and thoſe for great ones alſo that will make their own Advantage, yet uſe moderation herein alſo; A large Paſture is comely, and a little Pingle Inconvenient, Extremes are neither for Credit nor Profit, but for Deſtruction; A Paſture about one hundred, or fixſcore Acres, or a hundred and fifty Acres is very commendable where they lye remote and at good diſtance from great Market-Towns, or where Paſturing is very

Diviſions of Land advanceth.

Small Diviſions reproved.

ry plentifull, but if either Paſture-Land be ſcarce, or border upon Common Fields, or Heaths, or Forreſts, or if they lye neare or adjoyning to any good Market, or great City, leſſer diviſion will farre out-vy with greater in their price and advantage, the people lying under ſuch neceſſities of Paſturage, ſome to help to relieve their Common, and others to relieve the neceſſities of their own neighbouring Families; But in thy Diviſions be ſure to make them alwaies in the loweſt parts of thy Lands, that ſo thy Ditches may ſerve in ſtead of Draines, or Convoyances of Water, or taking away the Coldneſs that offends thy Land, every mans own Experience will patronize this Poſition.

But ſecondly, when any of theſe Rich Lands ſhall Degenerate into Moſſineſſe, Ruſhes, Coldneſſe, or Over-grow with Weeds, Nettles, Hemlocks, Sow-Thiſtles, &c. then thy Land will need good Husbandry, and wil admit of Improvement, for Hemlocks, Nettles, Docks, Chick-weeds, and other common Weeds, Theſe are as much occaſioned with Fatneſſe, and too much Richneſſe, as from any other cauſe; And when from this cauſe, no cure like Ploughing, for that brings Profit with the Cure, and Advance in the very Reducement; there is much Land of this Fatneſſe; Some there is in divers parts of this Nation, as about Hay-Stacks, or Sheep-Pens, or places of Shade, or in the Warmeſt parts of many Paſtures, which Sheep and Cattell chuſe alway for their Lieare, and very much about the heads of Conney Berries; All which according to former Direction (in Ploughing old Reſtie Land) will Reduce this to Moderation in over much Rankneſſe; And eſpecially if it be Ploughed ſomewhat oftner than the other ſorts of Lands, it will beare near as many more Crops without prejudice, and no other means whatſoever will ſo Surely, Feacibly, and Profitably, worke this Effect in my Experience, *viz.* To deſtroy the Weeds, and reduce it to perfect Grazing.

Ploughing the onely Cure of Weeds.

And as your Land degenerates to Moſſineſſe, Ruſhes, and Coldneſſe, none will deny the wonderfull certaine change and alteration thereof by Ploughing, if they ſhould, I conceive I have ſufficiently cleared it where I have diſcourſed of

Ploughing the only Cure againſt Moſſines, Ruſh, & Coldneſſe.

the second sort of Land at large in the thirteenth, fourteenth and fifteenth Chapters, and answered severall Objections made against the same; yet one or two more remaines to be Objected; Beare with me, I say, the more herein, as Coveting to beguile men of such Prejudice as possesseth most, and so deeply rooted, as will aske hot water to Mattock up.

Object. Against timely Soarding.

Some say they have found the contrary, their Land not Soarding of many yeares after, and when it hath come to Soard, it hath been neither so Rich, Thick, nor Fruitfull, and therefore Prejudiced by Ploughing.

Ans. 2.

All which I Eccho with thee that possibly it may be so, and yet this may not reach too, nor in the least weaken my Propositions, which gives direction onely to three or foure Crops at most, unlesse in case of Weeds and Nettles, and too much Fatnesse, I never advise to Plough thy Land so long to bring it to this, I abominate such Husbandry, neither doe I absolutely perswade to the Ploughing of all Lands without Exception, well knowing that in some parts of this Nation, there is some Lands so Binding, so Tough a Sodering Clay, and Cold, that it will neither Soard so thick nor quick as others will, which sorts of Land if Rich, and Sweet, will lesse Advance by Ploughing, than any other, but to this sort of Land as it doth degenerate and decay, use it as a Medicine, and use it as according to former Rules, and lay down thy Land according to former Limitations, and question not though it Soard not so soon as other Lands, Mixed Light, and more Losened, yet it shall both Soard so Timely, and so Richly as it shall counter-profit all thy prejudice. And for other Lands either Gravelly, Light, Warme, and Sandy, or else Mixed, and Compounded, I dare affirm some Land the first yeare may be full as good as it was before Ploughing; I have known a Winter Stubble after the Crop was Inned of some Pastures, worth as much that Winter half year as it usually was worth any Winter upon the old Soard, and yet hath not been Pastured the whole halfe year neither, nay some have been worth as much as the fayd Lands have been worth almost the whole yeare. The Eadish hath been so

Ploughing some Land must be used as a Medicine not as a Calling.

What Land it is that may Soard as well the first year to as much profit as before.

A president of Wheat-stubble its speedy Soarding.

ſo fruitfull, and my ſelfe have had the like Profits and Advantages, and have had a Wheat Stubble of my owne being the third Crop, that will make good what I have Affirmed, and the very firſt yeare of Grazing full as good, if not better, than it was upon the old Turfe before Ploughing.

They that cannot manage this Objection further, yet confeſſe and ſay, 'tis true for two or three of the firſt yeares it may poſſibly hold fruitfull, but it ſhall fall off after ſeven, eight, or tenne, or more yeares, after that it ſhall be worſe than ever. *Object.*

To this I can ſay little more than what I have ſayd before, unleſſe you can produce me ſome Experiment, wherein my directions have been obſerved, and your Prejudice ſucceeded, otherwiſe you ſay nothing; which Experiment when you have found, I ſhall not queſtion but to diſcover your miſtake, either you are miſtaken in the nature of the Land, or elſe in the manner or way of Husbandry and Ploughing, or elſe in the Method I propoſe in the laying of it downe to Graze, or elſe the Stubble you lay it down upon, in all which if you purſue me not expect it not, all being faciable, and any man may more certainly, and as I conceive more delightfully, work by Rule than Randome, I ſay then in the ordinary courſe of nature, Gods bleſſing accompaning it, it ſhall increaſe, and Improve for many yeares, and continue untill ſome of the former and aforeſayd Corruptions predominate againe; Of which my ſelfe hath had large Experiences, and can produce many Preſidents, and doe but you looke into and upon much of your new layd-down-Land to Graze, which being continually Grazed doth put more proofe into all ſorts of Goods, breed better, feed faſter, milketh fruitfuller than old Paſture that is Richer, for tenne, fifteene, or twenty yeares together. I have bought the pureſt Mutton out of Land the third, the fourth, or fifth yeare after Ploughing, being about eighteene or twenty ſhillings *per* Acre, than any Land in thoſe parts of neare thirty ſhillings an Acre hath afforded, and in reaſon it muſt needs be ſo, becauſe what Graſſe comes freſh, is pure without Mixture and *Anſw.* A preſident of fatteſt Mutton on the neweſt Turfe.

and sweet being Young and tender, and having no corrupt Weeds or Filth to annoy it, and fruitfull, having heat and strength left in the Land to feed it, and for continuance fear it not, if Grazed, for the very Grazing will Inrich it every yeare, and Improve it untill it grow so old againe, and over-runne with Mosse, Ant-hils, Rushes, or other corruptions, that it requires Ploughing; and then let it have it, for the Lands and thy Advantage sake; I know other Pastures which indeed were Ploughed nine or ten Crops, and did much prejudice the Lands thereby, which I exceedingly condemne, yet this President answers this Objection, it lying now upon the fourteenth or fifteenth year after Ploughing, is better than ever was since Ploughing, and mends every year, and is rich and healthfull if not more than it ever was, and would far more have abounded in fruit, if Moderation had been used.

Object. Another Objection may be raised which is this, your new Ploughed Lands are more subject to Rotting Sheep than your old Pasture.

Ans. I answer usually it is so, and Experience hath proved the same; yet if you ever found any parcell of Land Husbandred according to these directions, nicely observed as aforesayd, that it was layd so high and round, his over Furlongs Drayned by the lower, and a good Master Ditch or Trench the lowest, and Ploughed but three or foure Crops, and laid downe upon the Winter Corne Stubble, &c. you either found little danger in it for Rotting, or else no more than other Grazed Lands there abouts was subject to, for in great Rot yeares indeed, many of your Cold, Sowre, Rushy Pastures, Rot themselves though never ploughed, especially such as have either great Road-wayes, Drifts, or Passages through them; yet observe these two directions following, put case it should Rot first or second yeares, then Stock it with Beasts, and that prevents it, or else secondly with part Sheep, those barren Sheep to feed, and not with a breeding Stock, and part Beasts, and very easie that you may have Grasse at pleasure, to satisfie them to the full which will probably prevent them from eating Dirt or Gravell, and this will

Rotting Sheep in new Pastures well ordered may be rare.

To prevent Rotting in new Tilled Pastures.

will turne thee out as much profit and ſecure that danger in great meaſure out of queſtion.

As for Ruſhes, Moſſe, and Coldneſſe, which doth not much offend the beſt ſort of Land, I referre thee backward to its more proper place, and have little more to ſay in the Advance of this richer ſort of Land, but onely that in your Separations, and diviſions of your greateſt Paſtures, you be very curious in erecting Quick-ſet Hedges after the manner preſcribed in the Sixt Piece, and the three and twentieth Chapter, and be moſt carefull of preſerving them from biting and treading, and well fenced from any Annoyance, and maintained with conſtant Weeding for two or three yeares together, all which exactly obſerved, you ſhall raiſe upon each Lordſhip or Paſture, Fuell and Fire-wood ſufficient to maintaine many Families, beſides the Timber which may be raiſed in the Hedg-rows, if here and there in every Pearch be but planted an Aſh, Oake, Elme, or Witchazell, all which will not only be moſt profitable, but moſt delightfull and honourable unto men of Ingenuous ſpirits.

Separations and rayſing of Quick-ſet Hedges a great advancement.

Hedg-rowes a thing of delight and credit.

And if to this thou wouldeſt but adde the ſowing of Kernels, or planting Crab-tree Stocks here and there in all your Hedg-rowes, and graſting of them, and preſerving them preciſely till they come to Trees, how gallantly would this good Land nouriſh them? what a benefit might the fruit of theſe Trees yeeld either in Perry or Sider, to be tranſported into other parts, or elſe to releeve our poore at home? of which were there plenty this deare yeare, one third part of the Mault of this Nation might be ſaved, and ſo that Barley be for Bread; But more of this in his proper place, which I ſhall preſent thee with, as an admirable Piece of Improvement of it ſelf upon any Lands it is capable to be made, as a new Addition in Orcharding Improvements.

Here two or three words more to ſhew the great Prejudice men ſuffer for want of theſe Plantations, when they make diviſions or ſeparations in their Lands by new Quick-ſetting it.

When men have planted the Quick, they conceive then they have done, nor obſerving perhaps neither to plant it in

Reaſons why Quick-ſetting thrives no better.

the Over-moſt and Fatteſt Earth, nor for to Root all their Sets in the beſt Mould, nor when they have done to preſerve it from Sheep and Cattell, nor Mould it, Weed it, Hedg it, and ſecure it, as it ſhall ſtand in need, for three, four, or five of the firſt yeares, All which were it done upon all Opportunities, No man almoſt in the Nation would be either at want of Firing, or Timber, eſpecially were all ſuch Fields, Marſhes, Heaths, and Commons thus ſeparated and divided, all which are fecible, and might be done with great profit to all, and prejudice to none. I am aſhamed to ſpeake ſo much in theſe ſo eaſie and well known wayes of Husbandry, but that there is ſo much neglect thereof, as if men minded more their own and Publique Confuſion, and Ruine, than Profit and Advancement; Some will caſt Banks and Ditches for ſeparation, and plant no Quick at all in them, and ſo deſtroy as much ground as if they Quick-ſet it, and ſpoyle the ground to no advantage; and others will Quick-ſet and never Fence it, Weed, nor Mould it, and ſo it either periſheth at firſt, or elſe groweth dwindled, leane, and barren, not worth any thing; or elſe ſuffer it to be bitten, or eaten with Cattell, or elſe ſtifled with cutting or plaſhing before it is ripe or ready, that it comes to no thickneſſe, growth, or fruitfulneſſe; In all which were there but a little Patience, and Addition of a little more coſt and paines, there would not be one foot of ground more loſt, but a double or treble Advantage raiſed upon it in few yeares, and ever after, with no other Husbandry continued, but ever bring in double profit for the charge beſtowed, As in the cutting, plaſhing, ſcouring of the Hedges, which payes his coſt beſtowed, and ſometimes double and treble, and if it be a Hedge curiouſly preſerved, and cut juſt in his ripeſt ſeaſon, before it begin to die i'th' bottome, and have in it either good ſtore of great Wood, or Fruit-Trees planted among, the profits may ariſe to much more than is here ſpoken of.

Hedg-rowes a great help for Firing and Timber.

Not preſerving Quick-ſets when planted is ruin to good Husbandry.

CHAP.

CHAP. XVII.

Wherein I proceed to a ſecond ſort of Land, ſomewhat Inferiour to the former, wherein is diſcourſed the deſtruction of the Ruſh, Flag, and Mare-blab, altering the Coldneſſe of Nature, and the preventing the ſtanding Winters Water, and deſtroying Ant, and Mole-hills, &c. All which are moſt incident to this ſecond ſort of Land.

THis which I call a ſecond ſort is our midling Land (I delight in plainneſſe, and avoyd all Language darkning the plaineſt ſence, or whatſoever may occaſion myſterioufneſſe, or confuſion in the reading or practice) ſo that this middle ſort of Lands, as aforeſaid, is all ſuch Lands that are betwixt the value of twenty ſhillings *per* Acre, and ſix ſhillings eight pence *per* Acre, which ſorts of Lands as they lye under a capacity of the greateſt Improvement, I have handled them at large in the fore-going Diſcourſe, eſpecially under the four firſt Pieces of Improvement.

But as they lye under a Capacity of a moderate and leſſe Improvement fals here to be diſcourſed; and although I call it a moderate Improvement, yet being well Husbandred, according to the ſubſequent directions, may produce a double increaſe, and ſome farre more, and ſome leſſe, but in all a conſiderable advantage enough to encourage to the proſecution.

And poſſibly ſome of theſe Lands may be of the richeſt,

Vſuall wayes to kill the Ruſh, Flag, or Mare-blab.

and firſt ſort naturally, but by ſome Improvidence or ill Husbandry being degenerate are taln under this ſecond, and that where the Ruſh either hard or ſoft pr evaileth, or elſe where the Land lyeth ſo flat, cold and moyſt, that the Flag or Mare-blab thriveth, I ſhall here onely apply one remedy for the removall of them all, to avoid Tediouſneſſe, which is moſt naturall thereto, and cannot faile being punctually obſerved, and that is a way all men uſe already, though to little purpoſe, which is to indeavour Drayning of the ſame, as you ſhall ſee in moſt mens Lands both Paſture and Common, full of Trenches as they can hold, to their great coſt, and loſſe of abundance of good Land devoured in the Trenches, Heapes, and bankes, they make, and yet all is of little uſe, the Ruſh as fruitfull, and the Land as cold as formerly in compariſon. Therefore I ſhall adviſe far leſſe Trenching, and yet produce more ſoundneſſe; I ſay then, as I have often ſaid, ſeeke out the loweſt part of thy Land, and there make either a large Trench or good Ditch, or be it but the old one well ſcoured up (if there be one) to ſuch a Depth as may carry away all that water or Corruption that feeds the Ruſh, or Flag, from every other upper Trench thou ſhalt ſee cauſe to make, and ſo aſcend to any part of thy Land where theſe offences are, carrying with thee one Maſter Trench to receive all thy leſſe Draynes, along with thee, and there make a Drayne (yea all thy Draynes and Trenches) ſo deepe (for I preſcribe no certaine depth) as to that Cold ſpewing water that lyeth at the bottome of the Ruſh, or Flag, which alway either lyeth in a Veine of Sand and Gravell mixed, or Gravell or Clay and ſtones mixed, as aforeſaid, and thence will iſſue a little water, eſpecially making thy Trench halfe a foot, or one Foot deeper, into which will ſoake the Ruſhes food, which being laid Dry and Drayned away cannot grow, but needs dye and wither.

Drayning the moſt naturall way.

Much Trenching reproved.

How to finde the matter that feeds the Ruſh & Flag.

It is impoſſible without going to the bottome to doe any good; Our owne Experience ſhewes it, and ſo the depth may be two Spades graft or more, however to the bottome thou muſt goe, and then one Trench ſhall doe as much good as twenty, alwaies curiouſly obſerving that thy Trenches runne

runne in the loweſt parts of thy Ground, and through the Coldeſt and moſt qualieſt parts of thy Lands, and for the manner of making the ſame and further Direction therein, I ſhall refer thee back unto the ſecond Piece, the ſeventh Chapter, where I have ſpoken ſomething to moſt of the aforeſaid Paſſages.

How to draine Land well where there is no end of Trenching.

But if thy Land lyes upon a Flat or upon a Levell, and have many great wide Balkes, of which there will be no end of Trenching or Drayning, I muſt then aſſure thee it is to little purpoſe, yet art not left remedileſſe, for this inſuing direction will not faile, and will bring profit with it to pay for curing alſo, which is a moderate Plowing, Ridging all thy Balkes, raiſing and Landing all thy Flats, gaining them as high as poſſibly thou canſt, Plow all, and leave none, and doe this three yeares together, and obſerve ſuch former Directions as are contayned in the thirteenth, fourteenth, and fifteenth Chapters in the third Piece of Improvement; And by the bleſſing of God expect the iſſue promiſed, It will lay Land ſound and dry, more warme and healthfull than formerly, deſtroy the Ruſh and many other Annoyances beyond Expectation.

I have beene forced to be more large, and to ſpeake twice to one thing, becauſe of the ſutableneſſe therof unto theſe Lands, but eſpecially becauſe I cannot ſpeake enough to make ſome to underſtand it, nor others to ſet upon the Practiſe, and more eſpecially becauſe the Reader may miſſe the reading of it in the former part, unleſſe he take the paines as few doe deliberately to reade the whole; Therfore if thou wilt forgive this fault, Ile mend the next.

As for the Moale-hills, ſo great an Enemie to the Husbandman, and Grazier, there is ſo much Experience made for their Deſtruction, that almoſt every Ingenuous man is grown a Moal-catcher in many parts, and that is a certaine way, and yet in many parts men are Sloathfull, that becauſe all their Neighbours will not kill them, therefore they will not, ſo they ſuffer their Land one third part to be turned up; There is a Law to compell men to Ring their Swine, to prevent their Rooting, it were more advantage to the Com-

The Cauſes of Moals increaſing.

Want of a Law for killing of Moales a great mischief

mon-Weale, a severe Law were made to Compell all men to keep the Moale from Rooting; for he destroyes abundance of Grasse, he covers with the Mould, and Corne he throwes up by the Roots, which utterly perisheth, Spoyles the Mowers work, and Tooles, and rayseth Balkes in Meads, and Pastures, besides the worke he makes the Husbandman to spread some of them, the Cost whereof, were it but bestowed in Moal-killing, would prevent the aforesaid losses. And although I can make no new Addition to the Moales Destruction, there being so many Artists with the Moale staffe, Tines, and Traps of severall Sorts, of all which I commend the Pot-trap set in a Bank, or Hedge-row, which wisely Set and Planted at all times, but especially in the naturall Season of Bucking-time about *March*, will destroy them insensibly; Onely one thing more punctually observed in the time of breeding, will make such a Rout among them, which thy selfe or any ingenuous man may doe, as is not credible; one Spring at or about *March*, one Moale-catcher and his boy, in about ten dayes time in a ground of ninety Acres being just layd downe from Tillage, tooke mee as was verily conceived three bushell of old and young, they were not be numbred most of them being young and naked, and this he onely did by casting up their nests, which are alwayes built in a great heape of a double bigneſse to the rest, most easily discerned, and then immediately the old ones would come to looke their young which he would snap up presently also. Yet I desire to speake a word by way of Incouragement to the Ingenuous Husbandman, not to suffer so great Dishonour to Husbandrie, nor so great Prejudice to his Profit, as to suffer (were it possible) one to remaine either in Tillage, Mead, or Pasture, and if thou have any Opportunity of Water to be brought over any part of thy Land, it will drive them out and destroy them so far as thou canst lead it after them, that thou needest not be in any measure troubled with them in thy Meadows.

Pot-Trrappe chiefe Engine in Moale-Destruction.

Destroying the nests destroyes multitudes of them.

Water best to destroy Moals.

CHAP.

CHAP. XVIII.

And for the Ant-hills, more peſtilent and Offenſive than the former, in ſome Sorts of Lands.

THere is but a little Addition that I can make to what I ſpake before of Ant-hills deſtruction; But to quicken thee thereto, I ſhall be more large, being this is the moſt proper place: I demand what is the reaſon that infinite great Paſtures all over the Nation are ſo over-runne with them? Unleſſe men Accompt them Vertuous. Indeed ſome have ſaid, they Increaſe the Land in quantity, and ſo they may ſay with ſhame, for ſo they doe, but apparently Decreaſe it in quality, Worth, and Fruitfulneſſe, halfe ſome mens Land covered over with them, and what is the fruit of them? They beare plenty of wilde Time, Mouſ-eare, Phinns, Moſſe, and Shar-graſſe, you ſhall feldome ſee a Sheepe or Beaſt bite them, unleſſe for hunger, and then if a Sheepe or Beaſt be caſt among them, many times Deſtroyed by them. I would have thoſe men as are ſo far in love with them, but he intreated to ſpend a little time to ſee how his cattell Paſture upon them in the winter, and how they burne and ſcorch in Summer, and but make experience of three or foure Acres banking and the fruit thereof, and never conclude a demonſtration by Opinion when Experience may ſo eaſily reſolve the queſtion. For Curing of them, I ſhall onely direct the old Piece of banking of them, but in a more unuſuall way, and ſomewhat more ſpeedily, than formerly, yet make a banking Iron or Spade, made very thin or ſmooth on purpoſe, a little more compaſſe or comming than your ordinary Spades are, and deeper bitted alſo. A Spade that worketh ſmooth and clean will further this doubly, and then beginne with the crown or top of thy Hills, and ſo divide thy over Turfe into five, or ſix parts, and take down the coat or over turfe to the

Ant-Hills Deſtruction.

Object.

Anſ.

Ant-Hi's good to deſtroy Sheepe or Beaſts.

How to bank Ant Hill's moſt ſpeedily.

the very bottome of it, the Turfe being cut as thinne as possibly thou canst, so thou be sure to goe under the Roots of the Grasse, else it will not Soard so thick nor speedily, and so turne it downe round about the Coare, which taken out, and cast about thy Land so deep, that when thy Turfe is turned down, even just as thou tookest it up, even so lay it downe, every Turfe in its place, that the whole compasse of the Hill may be rather lower than the Surface of the Ground, and but a very little neither, yet lower it must be, because else the Ant will returne more readily againe: And secondly, because then it will receive more naturally the Water, or Moysture, which will occasion a more speedy Soarding, and prevent the Pismires returne, for the Moysture will not be endured by the old Inhabitants; And this done in the proper season, which is in the end of *November*, *December*, *January*, and beginning of *February*, which seasons if thou faile as good neglect them wholly; for thy Earth will neither have benefit of the Frost to mould it, whereby it will be spread with ease, and have some of the Winters raine to settle it into the Ground, nor the Turfe have fitting time to sodder and worke together before the dry weather comes to parch it, and loosen it againe, and so mayst lose a great part of that Summers profit which otherwise thou mayst receive; And if thy Land be cleane and free from Mosse, Rush, and other pelse, this will be a sufficient cure as to reducing the Hillynesse to Plainess, and thy Land to an exceeding good Improvement; and so herein I have no more to say, unlesse thy Land be over-runne with the aforesayd filth; but what is the Burden of my Song, and is the onely and sure Cure of most of the Maladies that occasioneth Barrennesse, which is prescribed as a soveraigne Remedy (*viz.*) Ploughing according to former directions destroyes them all, and brings meat in the mouth with it, takes away the Finnes, the Mouse-eare, the wild Time, and Shar-grasse, if used with moderation, and so I have done with this.

Why to lay them lower than the Surface of the Earth.

Sow-thistle a great annoyance.

As for the Sow-Thistle, the chiefe and onely Annoyance of all Thistles (as for other Thistles I scarce know how to rank

rank them amongſt thoſe grand Corrupters, becauſe the opinion of moſt men are, that they are moſt certaine ſymptomes of good Land, as uſually they are; ſo are Nettles, Hemlocks, Mallowes, &c.) and yet I had rather they were all deſtroyed than remain upon my Lands (but becauſe they are of leſſe offence, and we have greater Prejudices than theſe, I'le let them paſſe) but for the Sow-thiſtle, it is of ſo great offence that it deſtroyes all the Graſſe it covers, which is many times a foot round, and alſo ſo eaſie to be deſtroyed, that I ſhall put the Grazier or Farmer upon no other charge or trouble, but onely take a little Paddle-ſtaffe, as a Walking-ſtaffe, and give each one a chop at the Root as he paſſeth by them, which will be rather a Recreation to an active man, than a Burthen, and thus every day a few as they grow in bigneſſe, will in few dayes deſtroy them all; Or elſe a Shepheard, or Keeper of the ground, as he walks among his Cattell may eaſily keep them under, as he goes about his daily buſineſſe; But ſince I have found out a more certaine way which will deſtroy them at once ſpudding up, which being done as ſoon as the Thiſtle begins to ſpread, but they muſt be done as it were up, by, or under the root, which lyeth very overly, and if it be not cut at firſt chop, it may at next by the Root: I had the laſt yeare a Field of an hundred Acres ſo thick over-runne, that ſome Acres were as thick that one man could not doe above halfe an Acre in a day, I cauſed them to be ſpudded up by the root, which was done at two chops with my Spade, I was not only freed of them the laſt Summer wholly, but my whole ground is cleanſed of them for this yeare, and ſo I hope for ever. I beleeve the charge thereof was neare twenty ſhillings, or there about. A more certaine way I know not.

Eaſieſt way to deſtroy the Sow-thiſtle.

For Gooſe Tanſey, or Hoare Tanſey like Weed, I muſt needs make Proclamation, That he that can tell the deſtruction of it, ſhall doe a very acceptable ſervice; and for my ſelfe, I ſhould be very thankfull for the Communication thereof, for I can ſay no more but this, Never Plough your Land too long, nor out of heart or ſtrength by no meanes, for this occaſioneth it to grow more thick and fruitfully;

Gooſe Tanſey.

and also load your Land hard with Cattell in the Spring, and when it doth grow high and strong, Mow it downe about the end of Midsummer Moon, or in the dryest and hottest time of the Summer, but the earlier the better, and other meanes I can prescribe none other, but in all your Plowings soyle it well with good Dung, and lay it down rich, and full of spirit. I hope some man of Experience herein will help me.

Fearn how to destroy.

For the destruction of Fearne, I shall prescribe such poor means that thou wilt take offence thereat, yet however, Experience having proved the truth hereof, I will prescribe it, *viz.*

In the Spring, so soon as it beginnes to grow up a little above the Grasse, while it is young and tender, take a crooked Pole, or piece of Wood about six foot long, and let it crook at one end like a Bow, or come like a Sithe, with which thou mayst strike off all the heads of the Fearne, as low as thou canst to the very ground, if thou please to make it with a little Edge thou mayst, but it will doe without; And this course thou must take the second time also, as soon as it begins to sprout and grow up againe, which may be within three Weeks after the first; And thus having bruised and broken, and cut off the head the second time, thou shalt see such a destruction wrought, as thou wilt admire, the Reason I cannot possibly conceive other than this; This breaking, cutting, or bruising of the Stalk, doth give a kind of Check or Comptrole unto the Sappe which is ascending, that it causeth it againe to recoyle into the Roote, and so suffocates and choaketh the life and spirit of it, that it descends downward and dyeth in the Earth; This I am from a very Ingenuous knowing Husband informed, which not onely dedroyes it the present yeare, but for the time to come also, who hath made a more large and full Experience of the same than my selfe hath done; But I believe if it prove a very wet Summer, thou must not wholly expect the destruction of it. But in some parts of the Nation where Fuell is very scarce, it will be thought to be Prejudice by many to destroy it, especially upon Commons, where they reserve it for Fuel

The reason of Fearns dying.

on

on purpoſe, and is a very great help to poore for Firing; yet whether in thoſe very places it be ſo good as an Acre of Graſſe I queſtion, but there are other parts where it is little worth, and ſome places not worth getting, yet is the ruine and deſtruction of all the Graſſe it groweth over, for whoſe ſakes I have ſpoke thus much, and am ſure in moſt parts it is a moſt peſtilent weed

CHAP. XIX.

Treates of the deſtruction of Goſſe, Broome, Brakes, &c. and how to Improve ordinary Lands by Planting Fruit; and ſhewes how to preſerve Corne from Blaſting, and from Crows and Vermine, and gives a Deſcription of the Water Perſian Wheele.

AS for your Goſſe, Broom, Bracking, &c. which in ſome places where Fuell is very ſcarce, and the ground very bad, to preſcribe a Cure is little Advantage: but where either Land is good natured Land, or Broome and Goſſe of little value; or elſe where men deſire to Improve their Land to the utmoſt worth it can be raiſed to, it would be worth entertainment: But to give a perfect Cure thereof without conſiderable Coſt beſtowed upon it I know none; The beſt means for that, is to cut it in the hotteſt and dryeſt time of Summer, when the Sappe is drawn cleane forth of the Root, and many times this will deſtroy it. Eaſieſt way to deſtroy Broom.

But if thou wilt be a good Improver thou mayſt deſtroy it utterly, and treble the value of thy Land in the doing of the ſame; which is this.

When thou haſt cut thy Broome, thy Goſſe, Ling, or

Excellenteſt way to deſtroy Broom, Goſſe, Ling, and Bracking.

Bracking, it matters not at what ſeaſon; Then Plough thy Land, and make a Fallow of it if thou pleaſe; or otherwiſe, take as many Crops as thou pleaſeſt, more or fewer, all is one to this purpoſe, ſo as thou be ſure to Plow thy Roots up clean, and then Manure thy Land with what Compoſt thou canſt get, for I believe if thy Land be made Rich and fruitfull with any ſort of Soyle whatſoever, it will in a great meaſure mend it; But without doubt, if thou either Marle it well, or Chalke it very well, and afterward Muck it very well, to mollifie, and looſen, and open the Earth; or Lime it well, or Mud it well, and afterward Muck it over with good Cow or Horſe Dung, or any other good Soyle, as Houſe or Street Muck, it will not onely Improve it, but deſtroy any of theſe offences, or any other whatſoever that naturally ariſeth from Barrenneſſe or Coldneſſe; poſſibly once Manuring may not doe it, nor indeed canſt thou expect ſo great an Improvement with ſo little coſt; becauſe I reckon not that any charg or coſt thou expendeſt whilſt thou haſt it under Tillage, for that brings in thy charge againe in thy Crop, and ſo not to be put upon this Accompt; but that which thou beſtoweſt upon thy laſt Crop, for the laſt Crop I would adviſe thee to Manure to purpoſe, and ſo ſoon as thy Crop is got Manure it againe, for it will alſo bring in thy charge in the Crop of Graſſe alſo; and againe, whilſt thy Land is young and tender, for at this ſeaſon will one load of Soyle doe as much as two when thy Soard begins to grow Tough; yea as much as three, when it grows Moſſie, Ruſhie, or Filthy.

When one load of Soyle doth as much good as two or three

An unfailing way of deſtroying any filth.

This is a moſt certain Concluſion, which I have ever maintained, and proved by Practice, Ever to lay on Soyle that firſt Winter after Corning, and at one good Soyling have raiſed and excellent ſweet Soard the very firſt yeare, full as good againe as it was before upon the old Soard: And this gallant Advancing-way ſhall certainly deſtroy both Bryars, Bracking, Fearn, (Gooſe-Tanſie alſo if any thing will do it) Goſſe-Ling-Heath, or any thing elſe whatſoever occaſioneth Unfruitfulneſſe, and worke an Improvement above what is Expected. This way of deſtroying Broome, Goſſe, Bracking

ing, or any ſuch filth, would be of great eſteeme, had it been held out of it ſelfe under ſpecious pretences of rare diſcovery as ſome can doe, but I am confident it is an unfailing remedy, and will certainly deſtroy the pelfe as it inriches the Lands, and though many devices may be found out, or ſtrong conceits raiſed to do the ſame, yet at preſent I know none ſo certaine, nor ſo profitable.

There is another opportunity of Improving almoſt any ſort of Sound Land, of which I gave a touch in the laſt Chapter, Treating of the way of Improving the beſt ſort of Lands, of which it is moſt capable.

That is, by Planting all ſorts of Fruit-Trees in all your Diviſions, and Hedge-rowes, where they ſhall not Prejudice one foot of Land, and where they may grow as proſperouſly as in an Orchard, if you will but wiſely mannage them. Planting Fruit-trees in hedges is good husbandry.

The Coſt or Charge of this Improvement is as eaſie as any that can be made, if you will caſt it into a Method.

That is, when you make any Partition in your Lands, which I know you will not without a Quick-ſet Hedge, in which in every twenty yards you may Plant a Crab-Tree ſtock as well as a Thorne, only in Setting of it be carefull of Moulding it plentifully with the beſt Mould you can get: For that is the maine Piece in Planting as I conceive: To lay a good Foundation in every thing, prepares for a good Superſtruction; So that if the Root be Nouriſhed from the Earth, the Root will feed both Bough and Branch more plentifully: Therefore though thy Land bee naturally Barren, yet make that place all round about thy Stock a good compaſſe, as good as thou canſt, with good mellow Mould, and that which ſmelleth well in Digging is Fruitfull, containing the Juyce of Vegetables already prepared. Chiefe piece in Planting all fruits. Beſt Earth diſcovered.

The Tender Mellow Earth is between the two Extremes of Clay and Sand, and muſt needs be beſt: And thus having Planted thy Stock in good Earth, thy worke is halfe done, if thou doe but now and then renew the ſame, that is, almoſt as it were, take up thy Tree againe, or elſe get well under

the Roots, and so apply fresh Mould to them while they are Young and Tender: And this will cause it to Thrive without measure, and put forth a Gallant Smooth Barke, which is ever a Signe of a Thriving Tree: So that be but a little carefull in the Choosing thy Graft, both for it selfe and the Fruit of it, and then after Grafting have but patience in preserving of it a few yeares, and here is all the Cost Required.

The Improvement may be wonderfull, if men would but Plant their Grounds as in many Countries they doe, as in *Worcestershire*, *Hereford*, and *Glostershire*, and great part of the County of *Kent*, they use; Every Hedge-row is full of Fruit, and some men Plant whole Fields over, every thirty yards asunder, whereby they reape a Coople of Harvests, One of Grasse or Hay, and another of Fruits.

How to reape two Harvests.

O that I might but be a Remembrancer to this Poor Nation, of the many opportunities of Honour, Wealth, and Glory, it is Capable of, and that I could but perswade its Natives to take hold thereof, and deliver the Earth of those advantages it is so big withall: Judge the rest by this One Poore Piece; Were all men but Industrious herein, how might the very fruit that might be raised in this Nation almost relieve it in such a yeare of Scarcitie as this is like to be? If it would not be Bread to the Poore, as it might be in some measure, I am sure it would be Drinke, and how much Barly would that preserve to Bread-Corne that is now turned to Mault? Yea, had this very yeare beene but kindly and a Plentifull Fruit Yeare, what a great helpe would it have been to *England*? And might not *England*, had it beene but generally as Ingenuous, as some Members of it are, wee might have had twice as much Fruit as now wee have.

But certainly wee are afraid lest Plentie should be our Ruine, or else all men that Studie so much to get Estates at second hand, Each from other, would rather strive to gaine it at first hand Out of the Earth, the True mother, in whose Bowells is more Wealth than ever will be drawne forth, and enough to satisfie (whether theirs is or no I know not) I am sure all Ingenuous men desire it, that so they may be as the

the Midwife to deliver the Earth of it Throws, it will ſend forth enough, if thou wilt but lay an Egge in the Sand of the Earth, 'twill bring it forth: Help the Birth, be the Man-Midwife (who is never in uſe but in greateſt need) Need and Miſery is likely to be greater than is expected; Yea, I feare than hath beene of many yeares; If Cod worke not above man, And man worke not now with God, by all Prudentiall meanes whatſoever. And ſo much, and no more be ſaid of Planting Fruit-trees at preſent, untill I have gained more Time therefore, and Experience therein.

And now I reſolve to ſpeake no more of any more wayes of Improvement here; but onely One word of Preſerving that Wee have alreadie, and 'tis but onely to Direct a word or two how to keepe Corne from Blaſting, and Seed from Vermine.

An unfailing way to preſerve Corne from Blaſting.

For Blaſting is one of a Kingdomes Curſes, And therfore to Preſcribe naturall, abſolute, unfailing Remedies in all Places, and at all Times, is beyond my skill, yet one Unfailing Remedie there is, as to the Removall of this, ſo it is the Removall of all Cauſes or Occaſions of Barrenneſſe whatever; And that is ſinne, the Root that brings forth all: Firſt brought forth the Curſe, and ever ſince the fruit thereof: The Onely Cure thereof is our Lord Jeſus ſet upon the Pole, he muſt damne the Curſe for us, and in us; and wee by looking up to him, and our Application of himſelfe to us, Mourning over him, and humbling our Soules before him; Hereby muſt wee bee made Senſible of the Removall hereof, by which, and by no other meanes it is Removable

The moſt uſuall naturall helpe.

But the naturall Helpes as uſually are Applyed, are the Soaking or Steeping Corne in thick fat water, or Lime-Warer, or Vrine or Brine, and the Mixing-Lime or Aſhes with the Corne while Wet and Moyſt, that ſo it may receive part of Smithom-Meale, fineſt of the Aſhes or Lime upon it ſelfe, and Cloath it ſelfe with it, ſo as it may fall cloathed all over to the Earth, and ſo be covered therewith: This hath been Highly Commended of late as a great Preſervation of the Puritie of the Corne, and in ſome parts of the Chilterne Country, now put into great uſe, ſo that inſtead of their Uſuall

A good helpe to preserve Corne pure.

ſuall way of Changing their ſeed, which hath been an Old received Principle of great Advantage, (and I verily believe is very good Husbandrie) now they betake themſelves hereto: Yet however, I would not Dehort, but Perſwade men to the other alſo; Eſpecially thoſe that uſe to fetch their Seed out of Chilterne into other Parts or Countries of the Fieldon, who have found great Advantage by their Conſtant Change of Seed.

To preſerve Corne from Foules and Vermine.

And this is a very good meanes for the preſerving of the Corne from Fowle, or Vermine alſo, which Uſually devoure one part thereof before it can be covered, the Lime or Aſhes ſticking to the Corne, offends them ſo, that they will avoid it, and though I ſay it Inricheth not the Corne, or Land, no more than what that Subſtance of Lime or Aſhes is, that cleaves unto it; Yet ſo much it doth, and is a Helpe and a very good Helpe to the bettering of it; Yet not ſuch a Helpe as ſome men cry it up to be, as if it were as good as a Manuring, or Soyling, which uſually men beſtow upon their Land for Wheat; So as I would have no man Under-valew the leaſt Opportunity of Advantage any way; So I would not have any man deceive his Land, or himſelfe, for herein conſequently the Poore and Common-Weale are beguiled alſo.

An unfailing Prevention of Crowes Rookes, or Dawes from Corne.

There is one Poore Simple Piece of my owne Experience I dare not but Communicate, for the Preſerving early, or Late, Sowed Corne, or for Preſerving it when it begins to Corne in the Eare, from Crowes, Rookes, or Jack Dawes, and this was yet never failable to me ſince I found it: 'Tis no more, but Kill a Crow or two with thy Gun if thou canſt poſſibly upon the place, where this Vermine haunteth, if not, Kill one any where elſe, or if thou canſt not get a Crow doe but take any black Feathers of Crow, Raven, Turkey, Pidgeon, or any other Fowl, but let them be as black as poſſibly they can: And them take into thy Field where they Annoy thee, and in the moſt Obvious, Plaine, and Perſpicuous places, make a great Hole of two foot over, and about twenty Inches deepe, which Hole muſt be ſtuck round about the Edges with the longeſt feathers, and ſome of the ſhorteſt layd in the

the Bottome of the Hole, with ſome part of the Carkas if thou have a Crow, and that Turfe that you digge out of the Hole, or elſe that Earth, being layd round upon a heape, you may ſtick round with Feathers alſo; The Feather of one Crow will dreſſe two or three of theſe Holes, and about half a dozen or eight of theſe Holes, will ſerve for a Field of ten or twelve Acres; Which being done, and made on the higheſt Ground, obſerve the Creatures, whether they will fall in that Field or no, all the while thoſe Feathers remaine freſh, which may be will be a month, unleſſe great ſtore of Raine, or Weather, beat them much, and then they muſt be Renewed once againe, if thou ſeeſt need: And if they Annoy that place, or once fall thereabouts, I am much Deceived; I know they will not, you ſhall ſee as ſoone as ever you have made but one Hole, and they take notice of it, how great offence they take, if One Crow but diſcover it, there is worke Enough for him to call his Fellowes to behold the Wonder, hee'l gather all the Crows thereabouts to behold the ſame, which they will View with ſuch Admiration, as will make you admire the Creatures aſtoniſhment, The Reaſon is, as I conceive, no more but an Affrightment, or Aſtoniſhment, by a New and unexpected Object, or elſe from that Antipathie they beare, or ſome miſgiving, or feare of being Intrapped themſelves, that poſſeſſeth them, that they dare not come neare the ſame; Neither Gun powder which many uſe to dreſſe a Crow with all, nor conſtant Shooting of them, or Killing of them, ſhall not have the like effect; It cleares all the Field of every one to thy hearts deſire.

The Reaſon of the Crowes offence taken.

I promiſed to give a more Full Deſcription of the Perſian-Wheele, or Water-Wheele, to rayſe Water out the Stream that Drives it.

And for the more Clear underſtanding of the Deſcription of it, Imagine thou ſtoodeſt juſt before the Face of the Wheele, as it is Planted in the River, to View the ſame as the Water Drives it; but this is of a very Plaine Wheele, and as I conceive a Better and more Exact one may be Diſcovered.

1. The height of the Wheele may be betwixt fifteene foot

The fullet Description of the Persian Wheele.

to thirtie foot, or more if thou pleasest, according to the strength of thy Water, and the height thou desirest to rayse it, made just like an ordinary Under-shoot Mill-Wheele.

2. The breadth of the Sole or Ring of the Wheele may be also according to thy pleasure, from fifteene Inches to thirtie Inches broad, Ladleled as other Water-Wheeles are.

3. The Buckets or Kans to take up thy Water, if thy Wheele be about fifteene foot high, may be Six in number, or Eight if thou please.

4. The Buckets to such a Wheele, just so long as the Wheele is broad: The Bucket is made with four boards nayled to a bottome-board: Two sides run upon a strait Line, which are those planted to the Ring of the wheele, and to the Ladle-board, and the other two runne towards an Angle-taper, declining from twelve Inches in the But or bottome, to six Inches at the mouth one way, and from eight Inches at the bottome to foure Inches at the mouth the other way; the mouth is open alway,

5. The Buckets fill themselves in the bottome as the Wheele goes, and so lose some of the Water in comming up, and when they come almost to the Top; a Trough about three or foure foot long is Planted, as it were in the Ring of the Wheele neare the Spoakes of it, and takes the rest of the Water as it delivers it out at the Top, which may be about halfe the Bukets first take up, out of which Cisterne thou mayst either in Pumps or Trenches lead thy Water, for Watering a House or Land, as thou pleasest, up to that Levell; It matters not how slow thy Wheele goes, nor for any greater fall or height of Dam than will drive thy Wheele, which may be about two foot; It is of very speciall use; So hast thou as Plaine a Description as I can give thee, untill thou have the Figure or Forme Delineated, which will give more light to the Discovery of it, which shall among my other Tooles be Desciphered, with a further Addition of more Ease and Exactnesse in it, than is here Described, if God give an Opportunity.

The

The Fift Piece is a diſcovery of ſuch Simples and Ingredients, to be compounded with the Earth, with the Nature, and uſe of them, In Application whereof makes good the Improvement promiſed, and Meliorateth the Earth to all Intents and Purpoſes.

CHAP. XX.

Sheweth how in Tillage of thy Land, thou mayſt Improve it beſt, with an Addition of an Soyle, or Manure by farre, than upon the Turfe in Grazing, and in particular Treateth of Liming.

ALl Up-Lands whatſoever, eſpecially all ſound and wholſome Lands, will admit of ſeverall waies of Improvement, as, Improvement of Up-Land ſeverall waies.

In generall all coarſe barren Heaths, Lingy, Broomy Lands, be it of loweſt and meaneſt value, is ſuitable for Improvement, by Liming, and by all the Subſequent Compoſitions; All old Reſty Land, that hath not been Tilled of late, although it be coarſe of it own nature, and yeeld little Fruit, yet by Ploughing according to former directions, all Advantages obſerved for three or

four Crops, which I feare not but the heart and ſtrength thereof will bear it out, without Prejudice; I have known Six or Seven Crops taken, of Land not worth above five ſhillings or ſix ſhillings an Acre, and it very little the worſe, as generally all the Wood-Lands are apt to runne to Moſſe, and Fearne, Goſſe, and Broome, and to be ſo extremely overrunne therewith, that it bears nothing elſe, and if they be not tilled according to that ancient Principle all Husbandmen retaine, every ten, or fifteene yeares, they will runne into theſe Extremes ſo far, as that they will be of little uſe, ſo all other Lands of a better nature ſubject to theſe Extremes, no better way can poſſibly be than *Moderate Tillage*, according to the former rules preſcribed.

Preſident of Ploughing Wood-Land Land.

A Hubandmans old principle Wood-Land Lands Tilled every ten yeares, yea ſome every eight.

And in thy Tillage are theſe ſpeciall Opportunities to Improve it, either by Liming, Marling, Sanding, Earthing, Mudding, Snayle-codding, Mucking, Chalking, Pidgeons-Dung, Hens-Dung, Hogs-Dung, or by any other meanes, as ſome by Rags, ſome by coarſe Wooll, by Pitch Markes, and Tarry Stuffe, any Oyly Stuffe, Salt, and many things more, yea indeed any thing almoſt that hath any Liquidneſſe, Foulneſſe, Saltneſſe, or good Moyſture in it, is very naturall Inrichment to almoſt any ſort of Land, all which as to all ſorts of Land, they are of an exceeding Meliorating nature, and of moſt of theſe more particularly.

Means or Materials to inrich Land.

Liming of Land.

And firſt for Liming, it is of moſt excellent uſe, yea ſo great, that whole Countries, and many Counties that were naturally as Barren as any in this Nation, and had formerly (within leſſe than halfe an Age) ſupply with Corne out of the Fieldon Corn-Country, and now is and long hath been ready to ſupply them, and doth and hath brought their Land into ſuch a Poſture, for bearing all ſorts of Corn, that upon Land not worth above one or two ſhillings an Acre, they will raiſe (well Husbanded with Lime) as good Wheat, Barley, and White and Gray Peaſe, as *England* yeelds, yea they will take a parcell of Land from off a Lingy Heath or Common, not worth the having, nay many will not have it to Husbandry it, and will raiſe moſt gallant Corne, that naturally is ſo Barren, worth five or ſix pound an Acre.

And

Object. And though ſome object it is good for the Father, but bad for the Son.

Anſw. I anſwer, ſo are all Extremes whatſoever, that is, to Plow it after Liming ſo long as is either any ſpirit left in the Lime, or heart in the Land, or it will bear any ſort of Corn, or Graine, it will ruine it for Poſterity; But if that after Liming, men would but ſtudy Moderation in their Tillage, and not (becauſe the Land yeelds ſuch abundance of Corn) Plough or Till it ſo long as it will carry Corn, no nor ſo long as it will carry good Corn; But if men would after good Liming, take three, four, or five Crops, and then lay down their Lands to Graze, it would not be the leaſt prejudice; or if upon the laying of it down, men would but indifferently Manure it, or elſe upon the laſt Crop you intend to Sow, Dung it well before Sowing, and lay it down upon the Rye, or Wheat Stubble, it would produce a ſweet Turfe, and I am confident prove excellent Paſture, as good againe as it was before; but if after it is layd down you would Manure it once againe, a little Manure now will produce more fruit than as much more upon the old Soard, it would be warriſhed for ever; Many men have had ten Crops of gallant Corne after one ſubſtantiall Liming, ſome more, upon very reaſonable Land of about ſix ſhillings eight pence an Acre, ſome Land worth a little more, but more Land leſſe worth, and ſome upon Land not worth above one or two ſhillings an Acre, have got many gallant Crops upon a Liming as aforeſaid; ſome men have had and received ſo much profit upon their Lands upon once Liming, as hath payd the purchaſe of their Lands: I my ſelf had great Advance thereby, yet I lived twenty miles from Lime, and fetched it ſo far by Wagon to lay upon my Lands, and ſo not capable to make like Advantage as other Borderers. The Land naturall and ſuitable for Lime, is your light and ſandy Land, and mixed ſound Earth, ſo alſo is your Gravell, but not ſo good, and your wet and cold Gravell is the worſt, except your cold hungry Clay, which is worſt of all, but all mixed Lands whatever are very good.

Preſidents for Liming.

The Land moſt naturall for Lime.

As for your Lime, it is not of a hot burning nature as moſt

The nature of Lime quite contrary to the common opinion.

men conceive, and doe ſtrongly believe, and many have wrote; 'tis true it is of a waſting, burning, and conſuming nature, before or in the ſlacking or melting of it; and may be poſſibly in the meale or ſpirit of it; but in the uſe of it, and working it into and with the Land and Earth, and in the production of the fruit, it ſeems and appeares to be Coldeſt, and moſt fadning of Land of any Soyle whatſoever, and that for theſe Reaſons.

1. Becauſe of it ſelfe it is a heavy and weighty ſubſtance, and ſinkes deep, and loſeth it ſelfe ſooner than any Soyle whatſoever; if you be not very carefull in the keeping of it up, and raiſing of it, you will loſe it before you are aware of it, or can ſuſpect it.

2. Becauſe it ſo alters your lighteſt Rye Land, that though it be naturally Sandy and Gravelly, that it never before would beare any thing but Rye or Oates, yet by one good Liming it will be reduced to beare as good Lammas or Red ſtraw Wheat, with Barley and Peaſe, as your ſtrong clay Land.

3. Were it of ſo hot a nature, then it would have the beſt operation upon your coldeſt and wetteſt ſpewing Land, upon which it hath none, and all Experience ſhews the contrary.

How much will Lime an Acre.

As I remember about twelve or fourteen quarters of Lime will very well Lime an Acre, you may alſo over-Lime it, as well as under-Lime it; Alſo a mixtnre of Lime, Manure, and Soyle together, is very excellent, eſpecially for a few Crops, and ſo lay down to Graze I conceive is beſt; but by any meanes Till not long, for I ſay it is poſſible the Land may yeeld Corn being ſo exceedingly in Tillage, and ſo well wrought, as long almoſt as any Earth is left in it. I have ſeen many parts Tilled ſo long as there hath been little left but ſmall Stones, Flints, and Pebles; A *mad Cuſtome*, fly from it, your Lime will ſink downwards exceedingly, uſe all meanes poſſible to keep it as much aloft as you can, elſe you loſe it, and the benefit of it, and remember it, whatever you forget, and then you may plow and work your Land, as you doe with any other Soyle.

CHAP.

CHAP. XXI.

Sheweth the nature, uſe, and benefit of Marle, and giveth a Preſident of the Improvement made by it.

MArle is alſo a very gallant thing, I can ſay much for it, far more than I reſolve to ſpeake to, becauſe others have ſpoken much thereof, though little to my eſpeciall purpoſes; It is commended of all men, and very highly almoſt by every Writer, that ſayes any thing in point of Husbandry; therefore I'le ſay but little, onely acquaint you with its nature, and an Experiment made of it, and the ſeverall Lands it is moſt naturall for Advancement or Meliboration to a little quicken the Practice where it is found, and the Search for it where it is not yet diſcovered. Marle.

And for the nature of it, it is alſo of a colder nature, becauſe it ſaddens the Land exceedingly, and very heavy it is, and will goe downwards alſo, but being ſo much of ſubſtance cannot eaſily bury ſo ſoon as Lime will, and the deſcription of it is not ſo much in Colour (as ſome ſay) as in the Purity, and uncompoundedneſſe of it, for in my Opinion be the Colour what it will, it it be pure of it ſelf that it will break into bits like a Die, or but ſmooth like Lead, without any Compoſition of Sand or Gravel; and ſome others of it if it will ſlack like Slate-ſtones, and then if it will purely ſlack after a ſhowre of Raine, queſtion not the fruitfulneſſe of it. 'Tis poſſible ſome Countries may yeeld ſeverall Colours of Marle, as it is affirmed of *Kent*, wherein is found both Yellow, Gray, Blew, and Red, and the Red is ſaid to be the worſt there, which I will not here diſpute, becauſe it never fell under mine own Experience in that Country; yet I will ſay it holds not every where, indeed the Blew and Gray are very Excellent, and ſo alſo is the Red no leſſe; And whereas the Nature of Marle. Signs of good Marle deſcribed.

Sliperineſſe no Infallible ſigne.

the common ſigne is ſaid to be Slipperineſſe, or Greaſineſſe, in which I will not conteſt, but only I ſay there is ſome as good Marle as is moſt this day in *England*, which is not ſo, but as it lyeth in the Mine is pure, dry, ſhort, and if you water it, you ſhall finde it in ſlipperineſſe differ little from common Clayes; The only ſigne, but the pureſt and trueſt ſigne as aforeſaid, is the incompoundedneſſe of it, and if it ſlack alſo immediately after a ſhowre, and ſhortly after turne to duſt after it is throughly dry againe, and doth not congeale and conglutinate like to tough Clay, but diſſolve, feare not the Opperation, Adventure the Experimenting of it, the fruit will be anſwerable to thy hopes.

A Marling Experiment.

And now give me leave to tell thee a true Relation of one Experiment of my owne (becauſe I ſpeake but little but my owne Experiences) upon an hard Incloſed Wood-land Farme I rented, having ſome Land alſo in Common, amongſt the reſt I had about fifteene or ſixteene little ſhort Lands, or Butts, lay all together in the Common Field; All which ſaid Lands were ſo Gravelly of nature, that there was but about two Inches thickneſſe of Earth before you came to as perfect Gravell as any High-way, yea ſo exceeding herein, that in many places turned to Sinder (like that the Smith caſts forth of his fire, as the corruption of his Iron, Fire, and Coales congealed) and alſo ſo hungry and barren of nature, that before I converted it to Tillage, little or nothing was made of it; And to Graze it was not worth above two ſhillings an Acre, yet it was Reſty and old Turfe, and had laine long, may be fifteene or twenty yeares; And reſolving to make an Experiment I ſearched for Marle, and found it where none had ever been found in mans memory, nor within many Miles of it; and in an old ſtrong Clay Poole I conceived it lye, the which Poole I was forced to cleanſe, being full of Mud, that ſo I might make the better and greater fall of Marle at laſt, and my Marle was perfect Red, diſſering in nothing from Clay in colour, but in the breaking into bitts and ends like Dies, not ſlippery, as was diſcernable from Clay.

And becauſe I would make an undeceiveable Experiment of

of it (whichever was my greateſt Arrogancie) I carried forth that Mud alſo to my Land, and laid it upon two or three Lands, as thick againe as men uſe to lay on Soyle or Dung; I alſo Mucked with the Cart two more exceeding well, and as I remember Fold-Mucked two more; Alſo I Marled three or foure farre thicker then I Mudded the other; And one Land I neither Mucked, Mudded, Foulded, or Marled, nor laid any coſt upon it at all, yet Plowed them all alike, and brought them into good Tillage, and Sowed them as I remember with Wheat, and Rye mixed; and for the firſt yeare, I reaped very good Corne upon my Cart-mucked Land, and Fold Mucked the beſt of all, the beſt upon my Mudded Land the next, and upon my Marled Land reaſonable good, not ſo good as the aforeſaid ſorts yeelded (becauſe Marle yelds not forth his utmoſt ſtrength the firſt yeare. And upon that I laid nothing, I reaped nothing, no not ſo much as Straw, although I gave it the ſame ſeed, and the ſame Tillage as the aforeſaid Lands. Whereby you may perceive the goodneſſe of the Land, which is bad enough indeed when it will bear no Corn at all, for very little Land in *England* that is old and Reſty, and in good Tillage, but will beare ſome, either Oates or Tares.

Some Mucked, ſome Fouled, ſome Marled.

One no coſt at all.

The next yeare I Sowed Barley upon all ſorts of theſe Lands, and upon my Marled Land was moſt gallant Corne, and ſo was my Mudded Land, my Mucked Land was the worſt by farre, the Muck decaying, and upon that I Soyled not; I Sowed the ſecond yeare with Oates, and reaped nothing againe that yeare alſo; Then afterward I Marled that which before I had Mucked, and that which had not Soyle laid upon it, & brought forth nothing the two yeares before, which brought forth as gallant Corne as *England* yeelded; And after three or foure Crops my Mud decayed alſo, and that I Marled againe, and had the ſame Fruit as aforeſaid; and for my Marled Land that I kept in Tillage nine yeares, without any other addition of any Compact or Soyle at all, and had as goodly Corne as grew, and then I left the Land, and ever ſince with ſome ſmall addition of Fould or Manure, as they doe the reſt of their Lands; that out-ſtrips all the reſt,

A double Experiment.

Marle saddens Land exceedingly.

and is discernable from all the Lands to this day; herein observe how it saddens Land, this was Rye Land most naturally, but it turned to Wheat, Barley, and Pease; and as it is thus excellent for Corne, so it is also very fruitfull and inriching to Grasse-land, provided you take heed of Extreames, which most men are subject to run into, which is not to Till it forth of heart, for to Till it forth of heart is just as if you worke an Oxe off his leggs, a Horse of his stomack, or a Man off his strength, and then put them all to worke for Wagers with those that are in plight and strength; Try what service one of them will doe you, not a third part of that service they did before; Nor twice or thrice to Marle together I hold not proper, but when you resolve to lay downe your Land to Graze, be sure at the last Crop you intend to take (which may be the fourth, fifth, or sixth after Marling) then Manure thy Land well with Dung, which will so open, lighten, and loosen thy Land (for the lesse binding, and the more light, loose, and open, the more fruitfull) that it will produce a gallant Clovery, and white Hunnie-suckle Grasse, and Graze fruitfully; and then if as aforesaid, the first yeare after thou hast laid it downe upon the Wheat or mixt Corn-stubble, thou wouldest run it over againe with Dung it would pay the treble, I cannot forbeare inculcating these two (becaus I see it is so little practised in any part of the Nation) and I know it to be so wonderfull Advantagious, untill thou pursue the practice of them, if possibly never lay downe thy Land to Graze but thus, Let not thy Gayne or Profit of a good Crop or two, hinder thee of ten fold more, and dishonour thy Land, Prejudice thy Posterity, and defame thy Husbandry.

Extreames in Marling reproved.

How to lay downe Land to graze after Marling.

The Prime Principle in Husbandry.

Oh that this gallant Principle of Improvement of all Lands to their utmost worth, was naturally planted in all mens Breasts, tis true to get Wealth and Riches is naturall enough, and both in our thirsting and eager pursuite hereof by many lawfull common wayes, and by more indirect and baser meanes, Eateth out the very hearts and bowels of many, but thus to endeavour to raise Wealth out of the Earth by ingenuity, to raise soyle out of one part of the Earth to inrich

inrich another, or out of the Seas, or any way elſe by a meane and Low charg or poore workmens labour, depending upon the Almighty for that bleſſing, is that I ſo highly magnify: not having forgot the old Proverb of making honey of a Doggs —— ſo I believe any Land by coſt and charge may be made rich and as rich as Land can be, but not counterpoſe one quarter of the charge or labour which I neither affect nor indeavour to hold forth, but my reſolutions are to perſwade all mens Eſtates or parts to drive on all Deſignes for the Common good, ſo to Plow all thy Lands, as to make thy Lands Fitteſt and Richeſt to Graze, and then to Plow againe, when thy Land decayes in Grazing, and thy Plowing ſhall far out profit thy Grazing, I am confident a man might ſo Husband the matter, as neither of theſe ſhould hinder each others Fruitfulneſſe, but both helpe on each others Advancement.

Land moſt naturall for Marle.

Now the Lands upon which Marle yeelds great Increaſe, is upon your higher Sandy Land mixed or Gravelly, any ſound Land whatſoever, though never ſo barren to whom it is as naturall, and nouriſhing as Bread to mans nature, and will doe well upon any of theſe, though ſomewhat mixted with Clay, but ſtrong Clay in my opinion is moſt unſutable; But an exact tryall I never made thereof, therefore am not Peremptory, and although many men are of opinion that it can have little Operation upon Wet, Cold, Moyſt Land, I ſay ſo, if there be not a poſſibility to lay it Sound, and Wholſome, but that I believe thou mayſt doe moſt Land by Plowing of it up and Raiſing of it, as high as thy Land will beare it, and then a good Drayne or Maſter Furrow, if it will ſerve; if not, a deeper Drayning Trench will for Wet, and too much Cold, and Moyſture offends all Corne and Graſſe alſo whereſoever, as well as Mare, but thus done Marle will yeeld great ſtore of Corne upon this Land alſo out of queſtion my owne preſident was upon a very wet Land, upon a moſt ſharpe gravell.

CHAP. XXII.

Sheweth the usefulnesse of Sand and other Soyles out of the Seas and Rivers, Sands also are great Inrichments.

Sand.

AS for Sands manure, I conceive it warme of nature, and yet that is not the cause of its Fruitfulnesse, for then would all Sands have the like Operation and vertue in them, but of our inland Sands especially these which are naturally the Surface of the Earth, or else lyeth by Mines in Hills, and many other parts of the Nation, I conceive little Fruitfulnesse at all, however I challenge not Immunity herein from being deceived; I may be, for I have made no tryall at all therein, and therefore what it may doe upon a contrary natured Land I know not, if any have found benefit I desire to learne it, for Reason hath sometime deceived me, and so may others, but Experience never shall.

Of no worth or use at all.

Sand from the Land-flood are good.

But as for your Sands brought forth by the Violence of strong Land-floods, and cast upon Hills and Shelves in many Meadowes and other places in them is Fruit and Vertue, and I question not but the Application of them, either to Corne or Graze, will produce much Fertilitie; especially being seasonably applyed to such Lands as are most different from the nature of it selfe; for whatever causeth Barrennesse, be sure to provide a Soyle that will stand in constant oppositon to it, and so though one wast another, and both are weakened, yet the Earth is thereby bettered, as here the Sand is dry and warme, and something inclining to Saltishnesse, the Land I conceive best for this Soyle, is moyst, and cold, one while Heat and Cold, Dry and Moyst, contest together, the Earth steales from both, and is much Advanced thereby.

What Lands are naturall for Sands.

For

For in all Soyles and ſorts of Earth, there is a Combuſtible and Incombuſtible Nature; Each Wreſtling with other, and the more you can occaſion Quarrels and Contention by theſe, that is, the more you adde to that which is predominant, and ſo allay the diſtemper in the end, the more gaineth the Earth thereby; For I ſuppoſe there is a kinde of contrarietie in Nature, it was ever ſo from the Fall, and ever will till all be ſwallowed up againe in one.

Beſt Sand of all.

But there is another ſort of Land, and this is the richeſt of all, and that is your Sand upon the Sea-Coaſts, and in the Creeks thereof, which is very rich, yet in ſome parts it may be ſomewhat richer than others, as I conceive, for this Reaſon, becauſe all Lands that be bordering upon the Sea Coaſts might then be Improved by them, but in many, and moſt parts of the Nation the uſe of it is neglected, and I dare not have ſo uncharitable an opinion of my Nation, that they would neglect ſo great and facile an Advantage; In *Devonſhire*, upon thoſe Coaſts it is very rich, and upon the Coaſts of *Cornwall* alſo, and upon all the Southerne and Weſterne Coaſts as this is, if there were that fruitfulneſſe as there is in moſt Sea Sands, and is as likely alſo to be in this, unleſſe or untill men have made experience, and through experience thereof, I for my part ſhall be loath to have other opinion of it, but that it is of excellent fruitfulneſſe; and ſo all *Wales*-ward borders, ſo rich, as that they carry it many miles on Horſe-back unto their Lands, and make ſuch vaſt Improvements, as to raiſing Corne and Graſſe alſo, as is incredulous: Now, were it on the Northerne, Eaſterne, or Weſterne Coaſts, as rich as it is upon the Southerne Coaſte, as it may be for any contrary experience I have had, I could not beleeve the people to be ſo Droniſh as they are in ſome parts thereof, but that they would Draine out that Sweetneſſe to their Lands, as would coſt but little or nothing but their Labour; However I muſt abſolutely ſay, there muſt needs be great heart and fruitfulneſſe in theſe Sands alſo, becauſe the Richneſſe of the Sands is from the fat or filth the Sea doth gather in by all Land-flouds and Streames that bring it from the Lands, and alſo what the Tide fetches in dayly

What cauſeth ſo much richneſſe in the Sea Sands.

dayly from the Shores, and from that fat and brackish nature in it selfe, and from the Fish and other creatures, and thousands of other matters that putrifie in the Sea, all which the waters Casts to Shore, and purgeth forth of it selfe, and leaves in the Sands thereof, while it selfe is cleare and pure.

The Seas fruitfulnes by Fish.

And now being discoursing thereof, give me leave to let you know the vertue and excellency the Sea may yeeld, as from Sea-Weeds also, which *Cornwell*, and *Devonshire*, and many other parts make great Improvement of for the Soyling and Manuring of their Land, and that to very great advantage also, and further toward the Inriching of the Land, as from Fish of any sort, which is so fruitfull for the Land, that in many parts of the world they Dung their Lands therewith, but here with us, it yeelding more Advantage for Food to the relieſe of mans nature than unto the Earth; I'le say no more, unlesse any Capacity fall in of the dead putrified Fish, which is of no other use then to this purpose; A good Advantage might be made unto the Land thereof, as I said, before any Liquid Brackish-fat, Greasie-matter, and any thing that comes from, or is the fleshy matter of the creature, whether it be by Sea or Land, hath a secret operation in it to the Earths fruitfulnesse; Yea, the very Urine of man is very excellent, and of all Beasts very fruitfull, and very rich, and would be of more Accompt if men knew the worth of it: I have read of some that have done too strange things therewith to report, but most certainly 'tis worth labour to preserve it with most exactnesse.

Sea Weeds very good soyle for Land.

Urine fruitful.

There is yet another Opportunity, out of many of your great Rivers, and is from a Mudde or Sludg, that lyeth frequently in deep Rivers, which is very soft, full of Eyes and Wrinckles, and little Shells, which is very rich, yea so rich, that in some parts many men get gallant Livings onely by taking it up out of the Rivers, and selling it againe by the Load; One sort whereof they sell for one shilling two pence *per* Load, and another sort they sell for two shillings foure pence a Load at the Rivers side, which men fetch twenty Miles an end for the Inriching of their Land for Corne and Grasse;

The richnesse of Snayle Cod.

Graſſe; One Load going as far as three Load of the beſt Horſe or Cow-dung that can be made; They call it *Snayle-Cod*, and it hath in it many Snayles and Shels, which is conceived occaſioneth the Fatneſſe of it; The great Experience of this Piece, is made upon that part of the River *Thames*, which runnes from *Oxford* and *Reading* down to *Brainford*, and if my Information faile not (which I conceive I have from as good a hand, a Gentleman full of great Experiences in Husbandry Improvements; as hath not many Fellowes) The Lord *Cottington* drawing part of the River through his Parke at *Hanworth*, hath cut in the ſame River many Outlets or Ponds, ſomewhat deeper than the River, on purpoſe to receive the ſame, from out of which is uſually taken up great ſtore of Mud for the Advance of the Upper Lands, but whether this be that richeſt Snayle-Cod I cannot ſay, but beleeve it is very good, but upwards as high as *Cole-Brooke*, in that River it lyeth plentifully, all which not falling under mine own Experience, I can ſay little more unto for preſent, neither for the ſeaſons of applying it unto the Land, nor the manner of working the Land to it I dare not preſcribe.

Where the right Snayle is to be got. The chiefe River wherein this Mud lyeth comes from-ward *Uxbridge* by *Cole-brook*, and is not the *Thames* as I can yet diſcover, having made a Journy thither ſince I wrote the aforeſaid diſcourſe.

Only hence I conclude, there may as well be the ſame opportunitie in moſt Rivers of the Nation, which is a moſt unutterable Advantage; But I can ſay there is in moſt if not in all Rivers a very good Rich Mud, of great Fruitfulneſſe, which were it more ſought after would worke on more Experiments, and produce Advantage unexpected, it coſting nothing but labour getting, nor prejudiceth any, but profit to all, by clearing the Rivers, and great worth and vertue it muſt needs have in it, being the Soyle of the Paſtures, and Fields, common Streets, Wayes, Yards, and Dung-hils, all collected by the Floud, and drawn thither, where it concenters into Shelves, and Mines as I may ſo call it, and remaines for ever as an undiſcovered Advantage, where no uſe is made of it; but hereof more, if God give opportunity to the Author of Experimenting both this, and others of the ſame nature to the utmoſt Advancement of it otherwiſe, and in the mean while inquire it out thy ſelf.

Mud in Rivers of great uſe.

CHAP.

CHAP. XXIII.

Treateth of the use, and nature of Chalke, Mud of Pooles, Pidgeons and Swines Dung, and other Soyles and Manures therein contained.

Bacons Naturall Historie, Pag. 123.

AS for Chalke, Sir *Francis Bacon* affirmes it to be of an over-heating nature to the Land, and is best for Cold and Moyst Land, but as it appeares to me in *Hartfordshire*, and other parts thereabout, there are great Improvements to be made upon Barren, Gravelly, Flinty Lands, and it hath great Fruitfulnesse in it, but not having falne under my own Experience I dare affirme little therein, onely advise any that have opportunity therein to be well resolved of the Fruitfulnesse of the sayd Chalk, or of the nature of the said Lands, for there is some Chalke, though not very much thereof, that is of so churlish a binding nature, that it will so sodder and binde, and hold the Water upon the top of the Earth so long till it destroy the Corn, nor work a sterility in the Earth, that neither Corne or Ground shall yeeld but little fruit; but there is a Chalk in thousand places of great fruitfulnesse for Improvement.

Chalke.

Chalke mixed most certaine.

And I also conceive that Chalke, Earth, and Manure, mixed together, makes an Admirable, sure, and naturall fruitfull composition for almost any sort of Lands, and is a very Excellent, Unfallible Remedy against Barrennesse, and raiseth Corne in abundance, and inricheth it also for Grazing when you lay it down; many great Countries in this Nation are under this capacity.

Mud.

Also the Mud of old standing Pooles and Ditches, the shovelling of Streets and Yards, and Highwaies, the Overswarths of Common Lanes, or of Commons near Hedges, is

is very good both of it ſelfe, and compounded with other Soyle, Manure, Mud, or Straw; And very much account made thereof in ſome Countries; nay more than this of Manure that is made of Horſe or Cow, for ſome ſorts of Land, and ſome ſorts of Corn, which I conceive is for Lands very Flinty, Stony, and Gravelly, or a little mixed with Clay amongſt them; as alſo for Wheat and Barley it is very naturall, and is of conſtant uſe and great eſteeme in *Hartfordſhire, Eſſex, Suſſex*, and divers other Countries thereabout, and alſo to great Advantage being put in Execution in moſt of the Counties in this Nation, if Ingenuity was of as good eſteeme among us all, as is a baſe Out-landiſh faſhion, for no ſooner can that be brought into any part of the Country, but it will be diſperſed preſently into all the parts thereof; but ſuch as theſe, that are Advantage to all, and vaſtly profitable to the Practitioner and Common-wealth, are ſlighted and little practiſed.

Ingenuity not of ſuch eſteem as a baſe Out-land ſh faſhion.

Earth of a ſaltiſh nature is fruitfull, eſpecially all ſuch Earth as lyes dry, covered with Hovells, or Houſes, of which you make Salt-Peter, is rich for Land, and ſo is old flores under any buildings.

Earth covered with any houſe or barn is rich.

There are many other gallant Soyles or Manure, as your Pidgeons dung, a load whereof is more worth than twenty ſhillings in many parts, your Hens and Poultry Dung, that live of Corne, is very excellent, theſe being of a very hot, or warme and brackiſh nature are a very Excellent Soyle for a cold moyſt-natured Land, Two Load hereof will very richly Manure an Acre; ſo is all Dung, the more it is raiſed from Corn or richer matter, the richer it ſelfe is uſually by far; as where Horſes are highly Corned, the richer is the dung than thoſe onely kept with Hay.

Pidgeons and Poultry dung little leſs inferiour.

Horſes well corned make beſt dung.

There is another ſort of Soyle, and that is Swines dung, by moſt men accounted the worſt of all, nay not worth preſerving, out of an old received Tradition taken up by moſt men, upon what ground I know not, and ſo generally diſliked of almoſt every one, and therefore they will not Experiment it, and much an end no uſe at all is made thereof, poſſibly it came from *Scotland*, who knew they but the excellency

Swines dung moſt excellent ſoyle.

cellency thereof, they would love the fleſh the better for the dungs ſake.

Which to me is very irrationall, that an *Engliſh* man who loves Swines fleſh ſo well, that more Account and uſe is made of all the parts of him, rather than of the Beefe or Sheep, yea his very blood and guts are highly priſed, and yet the Soyle of him ſo much undervalued.

The great account of ſwines dung.

This Dung is very rich for Corne, or Graſſe, or any Land, yea of ſuch Accompt to many Ingenuous Husbands, that they preferre it above any ordinary Manure whatſoever, therefore they make their Hogs yards moſt compleat with an high pale, paved well with Pibble or Gravell in the bottome, where they ſet their Troughs partly in, and ſome part without the Pale, into which they put their meat; but the moſt neateſt Husbands indeed, plant their Trough without their Pale or Hog-yard, all along by the ſide of it, and for every Hog they have a hole cut, the juſt Proportion of his head and Neck, and cannot get in his feet to foyle his meate, and out thence he eates his meat forth of the Trough very cleanely and ſweet, they keepe the Trough alſo very cleane, they have their houſe for lodging by it ſelfe with dry ſtraw always for them to lye in, and their corniſh Muskings they caſt into the yard for that purpoſe, and all Garbidge, and all leaves, out of Gardens, and all Muskings forth of their Barnes, and of their Courts, and Yards, and great ſtore of ſtraw or weeds, and Fearne, or any thing for the Swine to root amongſt, to make all the Dung they can into the yard for rayſing dung, and here they keepe their Swine the yeare round, never ſuffering them to goe one day abroad, and here your dayry Husbands or Huswives, will feed them as fat as Peaſe, or Beanes, and are of opinion that they feed Better, and Fatter, and with leſſe meat, than when they are abroad with all their Graſſe they ſpoyle; Which I did more than three quarters believe, but now know it to be true of my owne knowledge. Some Hog-yards will yeeld you forty, fifty, ſome ſixty, ſome eighty Load, and ſome more, of Excellent Manure of ten or twelve Swine, which they value every Load worth about two ſhillings ſix peence

The uſage of their Swine and the making of the Hogyard.

How to feed Swine without any corniſh meat.

a

a Load in their very yards, and prize it above any other; This is practiſed much about *Kingsnorton*, both in the Counties of *Worceſter* and *Warwick*, and in many other pares, as in *Cheſhire*, *Staffordſhire*, *Derbyſhire*, alſo I beleeve, An Excellent Piece of husbandry; I ſpeake Experimentally hereof, having made great Advantage my ſelfe hereby, and doe far more prize it, than ſuffering Swine to run and courſe abroad, knowing that reſt, quiet, and ſleepe, with drinke, and leſſer meat will ſooner feede any creature than your meat with liberty to runne and ſtrayle and courſe about into harmes and waſh off what they getwith their meat, with their vexing and running up and downe, and doe adviſe as thou valeweſt thy owne advantage; ſome good dairies will make the ſoyle of their Hogyard produce them twenty or thirty pounds worth of profit in a yeare.

Raggs. As for Raggs of all ſorts there is good vertue in them, they are carried far and laid upon the Lands, and have in them a warming-Improving temper, one good Load will goe as far as halfe a dozen or more of the beſt Cow Dung. Woolls. Coarſe Wooll, Nippings, and Tarry Pitchmarkes, a *little* whereof will doe an Acre of Land, there is great vertue in them. I believe one Loade hereof will exceedingly well Manure halfe an Acre. Marrowbone. Marrow-bones, or Fiſh-bones, Horne, or ſhavings of Horne, or Broaths made of Beefe, Meat or Fiſh, or any other thing whatſoever, that hath any Liquidneſſe, Oylineſſe, or Fatneſſe, have a wonderfull vertue in them, let all be precious to thee, and preſerved, for every little adds too, and helps in the Common ſtock, and he that will not be faithfull in a little, will not be faithfull in a greater quantity, as is alway ſeene by conſtant Experience. Beefe broath?

Sheeps-Dung. As for Sheep-Dung, Cow-dung, and Horſe-Dung, ſuch old ordinary Soyle, I intend to ſay little, in regard the Common uſe thereof, which hath extracted the vertue and excellency to the Common-wealths great advantage, onely thus much I ſhall ſay by way of advice and reproofe from my owne Experience.

1 By way of advice, Prize them according to their worth: The Sheepes Dung is beſt, and a little hereof is of more

strength and heart than the others are, but whether it arise from the rich, and pure nature of the Dung, or from the warmth of the Sheeps bodies, I know not, but I conceive from both, because it warmes the Land and makes it comfortable; And therefore in regard of the worth and excellency of Sheeps dung, and in regard of the great want of soyle, Ile discourse a little more at large of a very good way to rayse easily great quantities of soyle, and that very good and excellent, by the helpe of one good flock of Sheepe, and that in the winter too, when foulding is more neglected and of lesser use: though I proposed it in the first Edition, yet because I set not forth the way of raising it, I fear occasions the neglect of it. It is but to make a good large Sheep-house for the housing of thy Sheepe in Winter, the comfort it will be unto thy Sheepe, will be double worth thy house charge, which may be Sheepe-cribbed round about and in the middle too, to fother them in the nights, herein once a week, or twice according as thou desirest the quantity of muck to rise, or according to the goodnesse of it thou expectest, bring in severall Loades of Sand either out of the streets or wayes, or from a sand-pit or mine, once or twice a weeke, and lay it three or foure inches thick, this renew every weeke or more, and let them sit upon it two, or three, or foure nights, or more, and keepe this with renewing as oft as thou pleasest, and what with their heat and warmth of their bodies and the fatnesse of their dung and urine, they will so corrupt or putrify the Sand, that it will turne to excellent rich soyle, and goe very far upon thy Land, and be far more serviceable than thou canst conceive; This of great use in *Flanders* and other parts of the World. And for your Horse Dung that is held to be too hot, but I never sensibly discerne any Inconveniences therein, especially where it is feared, let it be but well Wroxed or Rotten, and I conceive it is one of the best compost of Land, and I am sure, if it be Soyle of Horses, or Stables where is much Corne given, it is more hearty and rich by far, than that where Horses live of Hay onely; And for Cow-Dung tis as well known by all, both in nature and use, that Ile save further trouble.

How with great ease to raise rich dung.

Horse Dungs Excellency.

2. But

2. But by way of Reproof of one Piece of Husbandry in the applying theſe three ſorts of Dung to Land, I ſay, Men are miſtaken, in that they indeavour not all poſſible Expedition in laying their Dung upon their Land, when once they beginne, and in ſpreading of it as ſoon as layd on, and Ploughing of it into the Land as ſoon as ſpread, for if my Judgement faile not, they loſe a great part of the Fruit, Sap, and Vertue thereof, that carry it forth into their Land about *Midſummer*, or in that heat of Summer, and ſpread it all over their Land, and ſo let it lye open to the Aire and drying Windes, and parching Sunne, and Showres, which comming haſtily help to waſh it off their Land, and thus lyeth for a month or ſix weeks before they Plough it into their Lands, all over the Field or County, and many places more, which beſides the Raynes waſhing away, conſider but the Windes drying, and the Sun and Heat Parching, and Scorching of it, & Exhaling, and Drawing away the Spirit of it, and then tel me the Excellency of this Husbandry; to me it ſeems not rationall, Ile ſubmit to better Judgements, they that are of a contrary opinion, I deſire them to ſhew me Reaſon, and inform me better; And till I know better, I deſire to be excuſed.

A great miſtake in letting ſoyle be uncovered.

And for their Sheeps Dung, as ſoon as ever one Land is foulded, let the Soyle be covered immediately, let the ſeaſon or weather be what it will: Alſo in the Manuring your Green-Soard or Graſſe Land, doe little in the Summer, but either in the latter end of it, after *September*, or elſe all Winter long is the proper ſeaſon, when it may have raine to beat it into the ground, or Froſt to wrox it and diſſolve it; And though ſudden ſhowers will waſh ſome away, which is farre leſſe upon Graſſe ground than Tillage, yet if thou have any Land both below or under that thou Manureſt, thou needeſt not loſe the leaſt benefit, if thou pleaſe to turne it over, and let it floate thy other Land, with that which the Land-flood otherwiſe would carry away; And this courſe ſome Ingenuous Husbands hold in all their Lands, What Rain or Land-floods fall in their over grounds, they carry into the next below that, and float there, then what falls in that, with the reſt of that which is a floating there they carry into the

How to loſe none of the leaſt benefit in mucking any Land notwithſtanding Land-floods.

Some loſe no Land flood at all.

next, and so into the lowest, & so will not lose so much as the advantage of a common Ditch that carries the least Land-flood with it, but this falls in occasionally here, and therefore no more hereof.

Mault dust is exceeding Rich for Corn-land, and one load being sowed as you doe, or with your Corn, will goe as far as six load or more of good Dung.

Urine of mankind usefull for Lands.

Mans Urine is of great worth, this will fatten Land more than you are aware of, and it were not ill Husbandry to take all Opportunities to preserve it for thy Land. Of this somewhat is sayd before, therefore no more thereof, onely I have read of a good woman of *Kent*, that preserved it, and sprinkled her Meadow with it, which occasioned such fruitfulness (though at first a little yellowish) that some of her Neighbours went about to accuse her of Witchcraft.

Ashes.

Ashes also have a secret vertue and operation, of what nature soever or sort, that are burned throughly to dust, but your Wood-ashes are best, and usefull for Soyle and Compost.

Soot.

Soot also hath a vertue of Fruitfulnesse for Field or Garden as some affirm, but I conceive the most proper soyle for Gardens are your Sheep-dung, your Hen-muck, and Pidgeons-dung, with your well rotted Horse-muck, especially for cold Land; or else the rich Moulds, or any good Manure that is grown to Mould, is as good and naturall as any of the aforesaid Soyles, provided you lay good store of it thereon; and so also I conceive it is best for your Orchards, or young Nurceries of Fruit Trees, but of neither Garden nor Orchards Advance is my design for present, and so no more of that, much may be hereafter.

Best Manure for Gardens.

Ouse, or a kinde of fat Earth in Marsh Ditches, is of excellent use for stony, gravelly, flinty, or chalky Lands; there is an Earth or Mud got upon the River *Ware* in *Hartfordshire* near *Wolton* of very good use and advantage for soyle.

Stubble, or Straw.

Stubble of all sorts, and other Vegetables, the more in quantitie, or Straw, or Hay fothered upon the Land is very helpfull and of good use with every Husbandman, that I need say no more thereof.

Salts effect.

Sir *Francis Bacon* is of opinion, that Salt mingled with Corne

Corne hath a very good operation being ſowed with the Corne, which poſſibly may, becauſe brackiſhneſſe is fruitful to the Land. Alſo that Chalke and Lime ſowed with the Corn is very helpful, and that ſteeping your Corn in fat Water, Lime-water, or Dung-hill Water, hath a wonderfull effect to work ſtrange things; Of all which my ſelfe having not made full Experience, can finde no more Advantage therein, than juſt ſo much as is added to the Corne, either of the Chalke or Lime in ſubſtance, or ſo much as is added of the Soyle or Fatneſſe of either of the Waters, and no more; For having made a thorough triall thereof, found no otherwiſe, nor nothing of that great Advantage promiſed; But let not me prejudice any Ingenious trials of the ſame, others may finde more, poſſibly I might miſſe in the manner of my application, ſearch it out throughly I beſeech you.

How much Limeing Corn, or watering Corn advanceth it.

As for Oyle, I am confident it is of a very Inriching nature to Land or Corne, but whether the Coſt required will be requited I leave to Experience, for I have not forgotten the Oyling-Corn Patentee, that great deſign to ſo little purpoſe; who drew ſo many Scholars after him, but I had the happineſſe to eſcape him and his Patent too, though ſome payd dear for it.

Oyle, the fruit thereof.

The Leaves of Trees laid together, or caſt into ſome High-way, or Water-flows, or mingled with other Soyles, will make very good Compoſt alſo.

Leaves of Trees.

Alſo Fearne, or Ruſhes, Thiſtles, or any coarſe ſtraw, or Traſh whatever, flung, or caſt into the Fothering-yards, among your Cribs under your Cattell, will be both good Litter to lay your Cattell dry and warme, and will make very good ſoyle, as all good husbands know.

Fearne or Ruſhes will make ſoyle.

Some more particulars may be ſpoke too, and ſome further directions given, but I'le forbear, Experiencing theſe, will work out more diſcoveries. So much for this Fifth Piece.

CHAP.

The Sixt Parcell or Piece, which is a new Erection, or Plantation of divers sorts of Wood, and Timber, in such a way as shall raise as much in twenty yeares growth, as usually and naturally groweth in forty or fiftie years, whereby the Draynes or Ruins of Wood in this Nation may be gallantly repaired, and severall Groves or Plumps of Trees may be Erected about any Manour, House, or Place, for delight and pleasure; And in such severall formes as men desire, and as much Wood for quantity raised in one Acre, as is usually in three, foure, or five Acres of our usuall Copices, or Spring-Woods in most parts of this Nation. As also how to thicken those Spring-woods that grow so thinne, as usually most doe, whereby they might be made as thick againe,

againe, and yet not hinder the growth thereof.

CHAP. XXIV.

Speakes of the nature of the Land, and ſheweth the ſeverall ſorts of Wood, and how to plot out the ſame to moſt delight.

TO which purpoſe let all men uſe their utmoſt endeavours and skill to lay their Woods and Coppices, or Spring of Woods, as dry as poſſibly they can, for Wet and Coldneſſe is as prejudiciall and offenſive to the fruitfulneſſe thereof, as it is to Corne or Graſſe, or any Fruit-Trees, whether Apples, Peares, Plums, Cherries, &c. All which though every man indeavours little herein, and though to their ancient Spring-Woods little opportunity can be gained, yet what can be gained hereto proſecute it, as of great Advantage.

And for a new Erection of Wood, where never any grew, and raiſing of a new Plantation, which is one of my maine deſignes, a Piece ſo little practiſed, which before I have fully ended, you will wonder it ſhould have been ſo much neglected being ſo feacible.

Therefore when thou haſt deſigned a Piece or Plot of ground thereto, which ſhould be dry, ſound, and pretty hearty, thou needeſt not much matter what nature of Land it be, ſo that thou canſt get two Spade-graft, or one and an half of good Earth, before thou either come to the ſtrong Clay or Sand, yea though it have ſome Gravell, or Stones, be it but well mixed with good Earth, it may doe well, yea beſt of all, becauſe of hollowneſſe and lightneſſe of it, though it ſhould be very boggy Land, yet if it have any richneſſe

of nature or heart in it, thou shalt finde a marvelous suitableneſſe therein, to make a very good Improvement this way, yet the moſt naturall Land hereto in the Experiences I have made or ſeen, is your warme, open, gravelly, ſound Land, the richer the better, as aforeſaid.

The moſt naturall Land to plant with Wood.

When thou wouldeſt Plot out thy Land thou deſigneſt to plant, which thou mayſt caſt out if thou aime at thy delight and pleaſure onely, either into a Square, conſiſting of foure Equall ſides, or elſe into a Triangle, having but three equall ſides, or elſe into a long Square, which hath two equall ſides longer, and two equall ſides ſhorter, or an Ovall Capacity, or elſe into a Circular plot either, as thy Phantaſie leads thee, or if thou mindeſt onely thy profit, and intendeſt onely to raiſe Wood for thy uſe, and increaſe, and the Countries ſervice, it matters not into what forme thou caſt it into; howev erſeeing at the firſt it is as eaſie & no more chargeable, to caſt or lot out thy Wood into an Artificiall uniformable Plot, as to doe it rudely or confuſedly, I rather advice it, but preſſe it not, no further than as to the Gallantary and delightfulneſſe of it, or thy Spirit thereto, wherein may be as much pleaſure, Delight and Recreation, as in your curious Gardens, Orchards, Walkes and Bowers, eſpecially being planted about a Mannor Houſe, or dwelling place, for warmth in the Winter, and Shaddow and Cooleneſſe in the Summer, for which Advantages many of the Nobles and Gentry to this Nation would give great Summes to purchaſe; Which hereby may be obtained at an eaſier rate.

How to caſt out thy Wood-plots for pleaſure.

Method and confuſion to thee bring of an equal price, and probably method may be the cheaper.

Therefore having caſt thy Land into any of the Plots aforeſaid, except the Circular, which I conceive of leaſt ſuitableneſſe of all to this worke, then ſuppoſe it be ten, twenty, or thirty Acres, I ſuppoſe leſſe, if thou caſt it into a Square or Triangle, or Ovall way, then having found the midle of it, thou mayſt if thou pleaſe, caſt out a Circular round Plot or Ovall, containing either a ninth part, or a ſeaventeenth part, or but a fifth part, And that Incompaſſe in with a little Ditch, well quickſetted with thorne, and here and there an Aſh, Oake, Elme, or Witchazell, reſerving a Graſs-Plot to walke round about, of fifteen or eighteene Foot wide, and then

How to caſt out thy plot into moſt delightfull diviſions.

then equally divide the reſt into ſo many parts as thou intendeſt ſeverall falls therein, and every Diviſion ſeparate with a walke, or Graſſe-Plot betwixt them, containing fifteen or eighteen Foot wideneſſe, which will ſerve as a Cart-way, or Paſſage, to fetch out thy Wood at every fall, as well as for walkes for thy recreation, becauſe in this manner of Planting, thou canſt not Cart along thy Wood, as thou doſt along thy uſuall ſpring Woods, but onely along thy Borders, which when thou haſt ſo divided all by Ditches wich make thy diviſions, thou mayſt, if thou pleaſeſt to caſt thy Bankes outward, and ſet thy Hedge inward, Plant the Bankes with Strawberies, which will delight themſelves herein, and grow fruitfully, either on the Sun or Shady ſides. Now when thou haſt plotted out thy ground, prepare for Planting, and firſt inquire, and ſearch about the Country for Set-gatherers, ſuch as will bring them in every two dayes freſh, for the freſh gathering and ſuddaine ſetting of them in their places, is of more Advantage to the furtherance of the growth, than thou Imagineſt.

Planting Strawberyes, is excellent.

Secondly prepare ſuch Servants here as will not deceive thee; And avoid the getting of Eaten, Bitten, Rough, and Bruſhy, all being unproveable ſets, receive them not, but give them ſuch wages, as they may afford to get ſuch as are fruitfull and proveable, and if poſſible get them from off as hard Land, as thou Planteſt them upon, however be ſure they be thriving ſmooth Rooted, or ſmooth Barked ſets, of what ſort ſoever they be, and as ſtraight as poſſibly thou canſt procure.

How to get thy ſets for Planting.

Thirdly, for the ſeverall ſorts of Wood quickeſt in riſing and growing, generally are your ſoft Woods; as Poplar, Willowes, Aſpe, Sicamores, Maples, Witchazell, &c. your Aſh is a gallant thriving Wood, alſo, and indeed for quickneſſe and profit too, it is the beſt in my opinion, ſome good Oake ſets will doe very well, and Elme alſo towards your outſides; but if thou reſolveſt to be a Planter to purpoſe, then thou muſt be a Sower of all Seeds of the ſeverall Woods aforeſaid, or ſetter of many Sciens, and a Breeder up of Nurceries continually, for indeed were Planting more in

The quickeſt growing wood.

saſhion, Sets would prove very ſcarce, which now for preſent are plentifull enough, and in moſt part of the Nation may be had for two ſhillings, or two ſhillings ſixpence a thouſand, ſome more ſome leſſe, according to the goodneſs and bigneſs of them, and deareneſſe of the Country for workmens wages, and indeed the leſſer the ſets the more certain of growing, but the bigger they are, the fatter, and ſooner they riſe to their growth, only ſome of them may fail.

What Sets are beſt.

Fourthly, having prepared thy Sets, then ſet to Planting of them, which I adviſe after this manner, All thy Borders made, or but caſt out, thy Sets muſt be all Planted in the ſame way as thou wouldeſt Plant, or as uſually men doe Plant a Thorne hedge: Firſt caſt up by a Line a little Ditch about two Foot and halfe, or three Foot Broad, juſt ſo deepe and but a little deeper than thou canſt take up good mould, and ſo as all Labourers begin their turning Turfe doe thou, and then lay up a little mould, and there lay thy firſt Row of Sets, ſome ſay three Sets in each Foot, but I conceive if thy Sets be good two may doe very well, then cover them.

How to Plant thy Sets.

How to make thy Dike to plant thy Sets in.

Secondly, raiſe another Border about nine Inches above that, thy Mould or Banke layed well aſhore, or ſloaping, and there plant another Row, and cover them well alſo, as men doe their ſecond Row of Quick-ſets.

Thirdly, caſt up another Dike againſt that, like a double Dike, ſo as both may meet together upon the Top, and lye cloſe together, and then plant two Rowes more of Quick as was directed on the other ſide, and if thou haſt any quantity of ſpace, betwixt thy two upper Rowes of Quick, thou mayſt plant one Row upon the Top, or two, if thou ſeeſt cauſe, if thou haſt roome to ſpare; And ſo thou muſt goe on throughout thy whole Plantation, a Dike and a Land or Banke, and againe another Dike and a Land, and ſo throughout. And be ſure how-ever thou doe, to plant all thy Sets in the over-moſt beſt Mould or Earth, that thy Sets may neither roote in ſtiffe-binding Clay, nor hungry Sand, and feare not, leave no Land undigged or unwrought, nor plant none in Greene-ſoard by no meanes.

How to plant thy Quick, and mould them alſo.

'Tis

'Tis a ſimple Piece I confeſſe to make good the iſſue promiſed, but when thou haſt proved the truth of it, then thou ſhalt be better able judge of it. Many Objections will be raiſed againſt it, but let not the ſimplicity thereof offend thee; for I ſhall aſſure thee, I ſhall give thee ſuch a Preſident before I have done, and leave the thing ſo cleare, that there ſhall not be left the leaſt cauſe of Suſpition.

CHAP. XXV.

Anſwereth ſeverall Objections againſt this Projection, and gives a Preſident for making good the ſame.

THat you will lay your Land ſo dry, and deprive your Sets of all Moyſture, that it is Impoſſible they ſhould grow at all, eſpecially in dry, ſandy, or gravelly Land, much leſſe to grow to ſuch an Increaſe as is promiſed. *Obj.*

Hath two branches; Firſt, all Sets and Plants for the moſt part require Soundneſſe, and warmneſſe, and were many of our Spring Woods more dry, and warme, they would proſper much the better, although much dry, haskey, ſandy, hungry Land doth not many times afford a thick Coppice, or good Spring, which is eſpecially occaſioned by reaſon of the Barrenneſſe of the Land, and the ill Husbandring of the Spring after falling, not Preſerving of it from Cattells bruſing of it, as will appeare more fully before this diſcourſe be ended. *Anſ. 1.* But ſecondly, Experience ſhewes the ſame, that upon a ſandy gravelly Land, all the aforeſaid Woods proſper exceedingly in the way of the aforeſaid Planting, in ſo much that ſhould I tell you the Experience thereof, you would a little wonder at it. *Anſ. 2.*

A new Erection planted twelve yeares ſithence, at the Eventh yeares end a Fall was made, and ſo much Wood cut upon the ſame as was worth or ſold for ſixtie pounds an 2.

A Presidēt of Wood planted that one Acre was worth 60.l. at 11 yeares growth.

Acre or more; it was much Pole wood, yea a good part of it made Spars, and some part of it small building Timber, so that a Gentleman of that County builded himselfe part of a very good Barne, the whole Roofe of it with that Timber; and this yeare was another Sale of Eleaven years growth of as good a Value, the Land it was planted on was worth about ten shillings *per* Acre, and every Acre cost somewhat under seven pound an Acre, all Digging, Quick-sets, and all charges in the Planting of it; And the second Crop they make accompt will be as good at eight yeares growth; And to me it seems possible it may, if not better. This President is at *Billing* at the Earle of *Thomunds* in *Northamptonshire*, managed by a most Ingenuous Gentleman, called Master *Cartwright*.

What an Acre costs Planting.

Object. This way of Planting will certainly be so thick, that they cannot prosper one by another, or else it is Impossible the Earth should yeeld Fruit, Heart, or Sap to so thick a Plantation.

Ans. 1. Your Spring-woods, in some parts of them grow as thick, especially where your old Roots grow so thick, as you can scarce set one foot betwixt them, and every Root may send forth twenty or forty Spineyes, and yet all nourished from the Earth, and these Stooles they grow upon also.

Ans. 2. Secondly, I answer, that Experience hath also made it good as aforesaid; For other Planters in these parts Planted a foot or more asunder, and yet came not near this, nor is neither half so much in quantity; Nor yet the other thinner Plantation, although little or never the whit the bigger, or taller than this, which is so thick Planted, nor never worth so much by the Acre of many more years growth, as this at the Eleventh year.

And for the effecting of this Designe, thou must take in two or three more particulars, one is a strict Observation of the Season in Planting; And then secondly your Demeanure towards it after Planted.

First, The Seasons are as soon as the Leafe is falne, the earlier the better, faile not to be well prepared of Materials to begin with *November*, and so thou mayst continue three moneths

moneths compleat untill the end of *Ianuary*, and poſſibly ſome part of *February*, but it is ſomewhat hazardous, and may exceedingly faile thy Expectation. And for the Moons Increaſing or Declining, matter it not at all, nor any Seaſon, Wet or Dry, Froſt or Snow, ſo that thy Labourers can but worke, and be ſure that what Sets be gathered one day, may be Set the next if poſſibly, or next after; And ſhouldeſt thou be occaſioned by any hindrance, to keep thy Sets longer Unſet, be thou ſure thou get their Roots into the ground, well covered with good Mould untill thou canſt ſet them, and be not drawne away to the contrary by any Workmans perſwaſion whatſoever, for though the lying out of Mould or Unſet, do not kill them, yet it will ſo backen them, that thou mayſt loſe a full half years growth in them.

No Obſervation of the Moon. Eccl. 11.4,5,6.

Secondly, Thy Ground thus Planted, thou muſt be carefull in the Weeding of it, for I know no greater cauſe of this ſo great Advance than this; The keeping of the Ground cleane from Weeds, and as mellow and open as poſſibly, which will cauſe the Roots to ſhoot Exceedingly, and the Plant to grow abundantly, thou muſt for the firſt and ſecond yeare prize it, and dreſſe it almoſt as a Garden; And therefore be ſure thou preſerve it from any Beaſt, Horſe, or Sheep biting it, in the leaſt meaſure; ſhould Cattell breake in, they would deſtroy one yeares growth in a moment.

Weeding moſt neceſſary.

As for thy Boggy Land, much of it that is perfectly Drained to the bottome, that is little worth, will nouriſh a Plantation of Wood to good Advantage, eſpecially your Poplar, and Willow, and Aldar, your Aſh will grow well alſo; But therein you muſt obſerve to make your Dikes and Draines ſo deep, that you may lay it compleatly dry, you muſt goe under all your Bogge, to the cold ſpewing-Spring, and near a foot below that, and then what you plant upon the Bogs, or Lands, you may expect a wonderfull iſſue: 'Tis very common, in four or five years, that the Willow riſes to gallant Hurdle-wood, and in five or ſix yeares, to Abundance of Fire-wood, and ſmall Pole for Hops, and other Uſes. One Acre of new-Planted Willow, upon ſome Land not worth

Boggy-Land will bring forth a Plantation of Wood.

worth two ſhillings an Acre, may in Seven years be worth near about five pound, in ſome parts, an Acre; and in ſome parts of this Nation more. And I verily beleeve, were all the Bog-Lands in *England* thus Planted, and Husbandred well, after theſe Directions, might raiſe Wood enough to maintaine a great part of this Nation in Firing; And for other ſorts of Wood, the well Ordering and Nouriſhing it, although in Lands ſo bad, would produce a wonderfull Profit, far more than I will ſpeak of.

What one Acre of Willow Planted on Boggy-Lands may be worth.

And I ſuppoſe, he is no ill Husband that can raiſe a Bogge to a double Advance, conſidering ſome of them are worſe than nothing; But when they are ſo exceeding Coarſe and Barren, you cannot expect ſuch Fruitfulneſſe or Advance, as from that Land that is of a fatter or better nature; For certaine all Plants and Woods will doe much better, on better Land than on coarſer; And in caſe thou ſhouldſt beſtow Soyle or Manure on thy Land before thou Plant it, it would be both Labour and Coſt exceeding well beſtowed, and conduce much to the nouriſhing of a young Plantation.

How to thick Woods that grow too thin.

Now ſhall follow a Piece or Device how to thicken your Springs or Copices, where they grow thin or are decayed; Which fully obſerved, may doubly Improve the ſame, and ſuch a way is here projected as is little uſed in any Woods where I ever yet came, and as unlikely alſo as any thing I have yet ſpoken unto, which is no more but this: At every Fall, where thy Wood groweth thin, take a good ſtraight Pole or ſampler, growing of Aſh or Willow, at the uſuall growth of the Wood, and Plaſh it down to the Ground, about four or five Inches above the top of the Ground; not cutting it wholly off, and cut off the head of it, and put the over end of the Pole after the head cut off, a little into the Ground, which thou mayſt doe, by bending it in the middeſt like a Bow, and ſo thruſt it in, and ſo faſten it downe, once or twice from the middle of it, and upwards, cloſe to the Ground with a Hooke or two, and out thence where any branch would put forth ſtanding, will put forth lying, and more and more grow up to Plants and Poles, as the other

ther Spring doth, and ſo you may, though it be uncapable of Sets, or Planting with the Root, lay over all your Vacant places, and thicken your Woods where ever they are wanting.

And let me beg of thee thy credence here, it is moſt certain, I ſpeak out of own Experience, one of the gallanteſt Woods I know in *England*, it is conſtantly uſed at every fall in ſome place or other of it; the Wood is eighteen falls, every fall eighteen years growth; their very Faggots made at length of the Wood (beſides all their Pole-woods) all their bruſh being faggotted into the Faggot, were this year ſold for one pound three ſhillings four pence a hundred, and forty Faggots make a Load; it is worth about twenty five pounds an Acre ever fall. Study warmth all that poſſibly thou canſt, for any Plants are helped much in mounting aloft thereby; therefore as I conceive they proſper worſe upon your cold Clay, which nouriſheth the Tree little, and hath no quickneſs nor life to quicken the growth thereof; but by toughneſs and coldneſs of the Earth the Sap is ſhut in, and cannot get in to ſpread ſo frankly as it ſhould, and ſo inſtead of thriving of the Tree, the moſs proſpereth more fruitfully than the Tree. A preſident of a wood thickned.

Your Elm Plants may be gotten of young ſprouts growing forth of the Roots of the old Elm, many thouſands, which being ſlipped and ſet, will grow very fruitfully. Elme Plants.

Your Sicamore is a very quick growing and thriving Wood, eſpecially if it be planted upon ſome warm, ſound, and rich Land, they will thrive wonderfully, and riſe to gallant ſhade, excellent to make Walks, and Shadow-bowers, uſeful for inward building, where better is wanting, and for firing, where wood grows ſcarce. Sicamore plants

As for Sets of this nature, if you goe to any place where Sicamores grow, and there in the beginning of the Spring you ſhall find the Seeds chitted up and down as thick as poſſible; which gather up, and ſet them preſently, and you ſhall have your increaſe at large, being planted curiouſly from any the leaſt prejudice of biting, breaking, or ſhaking the ſaid Trees after planting, according to the firſt directions.

Sith the destruction of Wood increaseth so upon us, the which I should not so plainly reprehend, were there any care, zeal, or industry in the planting new; therefore I shall take boldness to inlarge my discourse a little further, and by way of addition speak a little more particularly to some speciall sorts of the most serviceable usefull Wood now growing, or necessary for the supply of the Commonwealth among us, hoping thereby to convince some of profitableness, others of the fecibleness; some of the commodiousness, others of the usefulness, and all of a possibility to recover some hopes of supplies hereafter, when the old stock is yet more wasted on purpose to provoke the ingenious to the Work. Old *Virgil* hath this passage;

That if of Woods he should frame a Song,
To Princes care they doe belong.
Ile make so bold as add to this,
If Rulers slight it, 'tis much amiss.

And if the *Romans* ordained that Consuls should have the Charge of Woods, that Timber might not be wanting for Shipping, and Buildings, and publick Works, I hope our States will judge it a *munus necessarium* among us. *Venice* at this day appoints an Officer for the Woods, who sees to planting yearly, as well as cutting down; and because we may be left more naked and convicted of our weaknes in this grand neglect of so great a publique and personal good as is the advance of Timber, I shall hereby inform you, that there is scarce the worst Land we have, but will bear as good Oak as the best Land in *England*. I have read, it was a general Custome amongst the *Ancients*, that when they found any so barren Earth as would not grass, they presently plowed it, and sowed it with Acorns, Ashkeyes, &c. and all other sorts of Wood-seed. We should grow wiser than our Fathers, and we may easily outstrip their experiences; but herein of all things else are we beneath them, they the planters, we the destroyers.

I shall therefore pray we may set upon this so good a work,

Work, every man doe a little. I ſhall therefore affirm, that we can ſcarce tell how to imploy one Acre of ground to more and greater advantage than to the ſowing it with Wood-ſeeds, a bed, or two in a Garden of each, would be a ſufficient Nurſery to plant many Acres; ſome to be drawn forth one year, ſome another, as the Plants grow in bigneſs, ſo they will require to be drawn forth to give the other more room; I dare ſay, that ſhould every Gentleman of a good Eſtate, but maintain one or two Acres as Nurſeries of all ſorts of Wood, he might be furniſhed to plant every year a thouſand Trees, and ſo as he drew his plants, repair his nurcery again, and need not have one hedg-row unplanted with good Wood and Timber.

Land as well imployed by planting wood, as any way.

And for further incouragement herein, I ſhall further ſay, that Trees well planted, and carefully preſerved, will grow to good perfection in one Age, eſpecially if the ground be open and looſe, and not too binding. Many men in England have ſet a Tree, and lived to ſee it come to ſuch a growth, as hath been worth above twenty ſhillings, neer thirty; but I have been credibly informed by a gallant ingenious Knight, who reported of his knowledge, that a Gentleman in the Low-Countries, or *Germany*, planted one hundred Aſhes, and at the end of fifty years reſolved to ſell them, and did, the price for which he ſold them was five hundred pound; and he that can improve ſo much Land better, I ſhall deſire earneſtly to be his Scholler. The ſame Knight alſo affirmed that he knew another Merchant there, that planted ſo much wood in his own Life, that he would not take 50000 *l.* for. Then how much Wood may be planted in this Nation, and the Lands not leſs worth than now they are. I know ſome Lands not worth above 6 s. or 8 s. an Acre, that hath yeelded in wood above 50 s. an Acre *per annum*: And if this Government ſhould compel all men to plant five times as much as they deſtroy, they compel them to their own great advantage and honour, witneſs my aforeſaid Engliſh Northamptonſhire Preſident.

A preſident of 50. yeares growth of Aſh.

Now to thoſe common and moſt uſeful Woods among us, a word or two, and firſt of the Oak, that non-decaying timber.

Oak plants.

It is somewhat slow of growing, by reason of the weight, substantialness, and worth thereof, yet will in the way of ingenious husbandry quit his cost and charge bestowed; you may either plant it from the Set, or Acorn; from the Acorn I advise, because then you may chuse your seed from a likely thriving Tree, which sowed in a Nurcery, or on Beds of purpose, no disparagement to your Gardens, or Orchard Nurceries, to have a Nurcery of all sorts of Woods planted among them. I know a gallant Gentleman in *Kent*, most ingenious for publique improvements, as well in waies of Husbandry, as publique services, who maintaines a constant Nurcery of all sorts of Wood-plants from the Kernel, among his Nurcery of Orchard Fruits, and is so stocked with all sorts of Sets, not onely to supply himself, but may furnish a great part of the Country also, it is Colonel *Blunt*, living within a mile of *Greenwich*, not only honourable in his name, but in the effects and fruits of all his actions.

A president for Nurseries of Wood.

I conceive it is indifferent, when you sow or set your Acorn, your ground prepared, and in good tillage; but why not at, or in *October*, as soon as they be ripe, or in the Spring early; but be sure the Acorn be full ripe, and the best time to remove them, or transpant, may be in the end of *November* or *December*, into your fields where you do intend they shall grow, being planted a good depth in as good double-field mold; which done, you must be as carefull of biting, shaking, or breaking of them as you are of the Nurcery, untill they be so rootened and stifned so strong that they will endure a beast rubbing upon them, which had need be above 7. years; and if you intend them for Timber, cut not off the heads by no means, but chuse strait and smooth thriving barqued Sets as you can, and support them from shaking with the wind for two or three years at least, untill they be most firmly rooted, so will they run up strait and tall, and prove gallant large Timber; and in the removing of them, be very carefull of bruising them also, for if you bruise the top or head of any part, better cut it off; but if you intend them for lop or shade, or for bearing

How to plant for Timber.

maſt, then cut off the heads of them, they will ſpread the better, inlarge their boughs and branches further, and yet make good Timber too, and very good, though not ſo long, yet may poſſibly be as profitable as the other. The Oak agreeth well with any Lands, good or bad, Clay, Gravell, Sand, or mixed Land, warm or cold, dry or moiſt, as appears by the naturall growth of it in all Countries; but for artificial planting, I ſhould adviſe to a middle mixed Land, yea thought it be but barren, it thrives excellently upon as barren Lands as any are in *England*; the coldeſt, ſtiffeſt Clays is worſt for all ſorts of Woods, your open, looſe Lands is beſt for any Woods, or Fruits, and the Oak takes not pleaſure in your richeſt ſoils of all, but I queſtion not the well proſpering of it there too, and may be the cauſe why ſo little of it is found upon your richeſt Lands, may be, becauſe the Land may, or is put to a more profitable uſe; for this I muſt needs acknowledge, that in many parts where Land is rich and dear, or lyeth near great Townes, and letteth at great prizes, the wood being in danger of ſtifling and ſpoiling by Wood-ſtealers, the Land may turn to greater profit; yet however, where Land is good, I ſhould adviſe to ſome wood, though planted here and there a tree in hedg-rowes, and where they may not prejudice the graſs, or ſhade the ground, it will be not onely an improvement in good meaſure of the Land, by adding to the in-com the fruit thereof, as well as of the graſs, but an honour and delight unto your ſelf and Poſterity. The Oak-maſt maketh fat faſt fleſh, and long laſting Bacon, and will feed Deer, Sheep, and Poultry exceeding well and profitably. I have read of an Oak in *Weſtphalia*, from the foot to the neereſt bough, one hundred and thirty foot, and twelve foot thick, and of another ten yards thick, which may poſſibly be; but I am ſure profit and honour ſufficient will attend an ingenious plantation of any ſorts of Wood.

Open looſe land the beſt for any wood.

An Oak above 40 yards in Timber. Another ten yards thicknes.

This is moſt renowned for Shipping, or any the ſtrongeſt and moſt enduring works or buildings, or for the moſt curious Wainſcot, or indeed for any uſe whatever. I ſhall be brief in all the reſt, becauſe that much that I have ſaid in

the planting of this may be applied to the reſt; the Barque is of as great worth, as of need and uſe.

Beech wood the uſe and fruit.

The Beech is alſo a maſt-tree, and very uſefull and profitable, both in the Body, Branches, and Fruit thereof. The Body is very good Timber for the Joyners uſe, and for the Husbandman for Axol-trees, and for much Building, and the Bough for firing, and the Fruit for feeding Hogs and Deer, and I know not whether for Poultry or Sheep, but it makes meat ſweet and delicate, light of digeſtion, but not ſo long laſting as Peas or Acorns. It delights moſt in your warm Land; it grows well upon gravelly Land, and Lands very ſtonie, and in the Chiltern Countries, and ſandy ground, and balks not the barrenneſt Land, likes well, and better the hill and mountains than the plain: The Barque thereof is uſefull for the floats of fiſhing-nets, and pantofels for Winter, and if you ſpoil them of their Barque, they die. This wood groweth ſomewhat quicker than the Oak, and is more inclined to ſome Countries than to others, eſpecially your Wood-land parts.

The Elm deſcribed.

The Elm groweth eaſily; it is all heart if it be fallen in his ſeaſon, which is when the ſap is fully and clearly down in the root, betwixt *November* and *February*; it takes great delight in ditch-banks, and dry places; they will grow thickeſt of any wood whatever, and proſper, and as I conceive, the moſt advantagious planting them is in hedg-rows, or in little Plumbs of themſelves. As for the Elm-ſeed, I can ſay but little, becauſe I never made experience thereof, onely it is affirmed that there is a male and a female of the Elm, and that the male Elm beareth ſeed, and not the female; which if it doe, then the ſeed when it is ripe may be ſowed as other ſeeds are, upon a bed by themſelves, and fine mold ſifted and caſt upon them; and if they be dry, they as other ſeeds muſt be watered, and ſo ſowed in little rowes, that a little trench be betwixt row and row, that they may not root one into and upon another, but ſo as that they may be taken up again with more eaſe, to remove and tranſplant where you pleaſe.

You may get Sets of the very roots which ſprout forth of it,

it, and set them, and they will grow; and very many affirm, that any Elm, or a very chip, when the sap is firm and proud, will grow unto a Set.

But this I had from a Gentleman of credit, as a speedy way and unfailing to raise Elm-sets or Plants; which is, dig round about a well-grown Elm a foot or more from the body, unto many, or most of the Master-roots, and cleanse away all the earth, and then cut the root almost quite through with an ax, and so serve most of the roots, and if you cut some full through, you may, and forth of both those ends of the root you cut or divide in sunder, will come forth gallant sprouts, or plants, which you must take off with a little part of the root, or a little chip thereof, and plant it, and it will assuredly grow to a good Tree. How to raise Elm-plants.

The use and worth of the Elm is little inferiour to the former; it is of absolute and singular use, especially for water-works; good for building, where it may lie constantly dry, or constantly wet, but sometimes dry, and sometimes wet, it will not long endure: It makes excellent Plank, and good board, the best wood in *England* for Wheelwrights Nathes or Hubs for wheels, and good for felly timber also. The use of the Elm.

In your second Plantation, or removall, set them in very good order, and be carefull of preserving them as a garden from shaking with wind or cattel, or from biting or rubbing by all meanes.

Some write, that in your second removall you may doe best to tie some knots of some of the string, or twist them like a garland, and then set them, and tread the mold down about the roots first anointed with Bullocks dung; but my self having made hereof no experience, cannot press it; all I say is, a small matter will make out the experience, which I encourage to. The Elm groweth to great worth, hinders little ground, delights in sound warm Land, dry, sandy, gravelly, or mixed Lands, but it must have good store of mold by all meanes; it doth not delight in cold moist clays, nor spewing weeping Land: One Acres length with one or two rows of Elms upon a ditch bank at their full growth may be worth 20. or 300 l. it runneth up generally to the greatest height

height and length of any Wood in *England.*

The descripti- of the Ash.

The Ash is also a gallant quick-thriving Wood, but it takes not so much pleasure in a hard, barren, muontainous Land as the Oak or Beech do. It will grow in good Land, and in Land of any nature or temperature, almost, whatsoever: it will thrive reasonable well upon a Boggy ground, so the same be deep Trenched to the bottom, and layd dry and sound. It delights it self in dry sound land, and will grow very fast if it like the land; faster than any of the aforesaid Woods; witness the Dutch Precedent I brought before; speaking of the excellent and great advantage Wood might yeeld, in my discourse about the Oak, which I here forbear.

The use of the Ash.

The use of the Ash is most manifold; good for Building, and for any work where it may lie dry; most prime for Coopers Hoopes, and Rimms for Sives, and Wheeles, as Oak is also; and excellent for the Wheelwright, Ploughwright, and the Husbandman; far tougher than any of the woods aforesaid, and very rich and profitable, and the best Firewood, fittest for Ladies Chambers, will burn exceeding well, and sweet, though green; but all this excellency unless for firing is quickly spoyled, If you fall it forth of season, it will worst of any Wood bare the mistaking of the season; the Worm will take it speedily, and make it the most unserviceable of any wood whatever. The onely season is from *November* untill the end of *Ianuary*; for if the sap begin never so little to arise, forbear falling Ash. It spreads his toot very large, and so is most offensive to your Corn land; because it both draws away the heart from the land, and offends the Plough by his roots.

Season for the Ash its felling.

You may sow the Ash Keyes, which are the only seed, in beds by themselves, and they will grow amain; two or three good beds will store a Countrie; draw them as they biggon; and at the last draw all away, or else they will destroy your Nurcery: plant them in *Ianuary* or *December*, mould them very well, and carefuliy preserve them; cut not off the top if you would have it to grow in length; it being a pithy wood, it wil somwhat endanger it; but it may

prosper

proſper well, though cut a little off the top, and ſpread better, and be very uſefull both for Timber, Lop and firing: I have heard of a poor woman that had two or three aſh-trees in her Garden hedge, & a ſtrong wind came and blew the Aſh Keys all over the Garden, that at the Spring, her Garden was turned from that to a hopfull plantation of Aſhes as green as a leek above the ground, the woman was at a great debat, to looſe her Garden ſhe was loth, and to deſtroy ſo hopefull a crop ſhe was unwilling: at laſt ſhe reſolved to let them grow, and now her garden is turned into a nurcery, and ſhe is turned a planter, and hath ever ſince maintained it to that uſe, and made many times more profit than ſhe did before.

A preſident of Aſh his growth and advantage.

The ſlips from the roots are not ſo good ſetts at the ſciens or ſprout from the Key, that is far the beſt Set, beeing ſtraight and ſmooth barked, and free from canker. Their removing muſt be in the depth of winter, that it may have a whole winter to faſten the roots, the roots may be cut in the removing a little, but the ſtrings no whit at all. It is a Tree of marvellous great advantage to the Common wealth, & very profitable to the Planter. *Pliny* writes that the Serpent ſo abhors the Aſh, that it will rather chooſe to run into the fire than through the Aſh boughes, but no more of this.

The beſt ſetts, &c.

The beſt time to remove Aſh.

The Birch tree will grow in the barreneſt land, it will not proſper in good land, it is good for ſome common meaner uſes, as to make Oxe yoakes, and ſomewhat uſefull for the Turner, but moſt eſpecially for the fire, where wood is ſcarce and deere, it may be worth your planting, or where the land is ſo barren that it will bear nothing elſe: *Theophraſtus* writes of it, that it will grow in froſty, ſnowy, cold Countries, and on the hardeſt gravelly land, and therefore on the barreneſt land they plant Birch, Pine wood, Firre, Pitch tree, and Larſh.

Birch.

The Walnut of another uſe, & beareth a very galant delightful fruit, taketh his pleaſure in dry ſound wholſom land; the uſuall way of rayſing them is from the Nut, ſet or ſowed, and preſerved a yeare or two in the Nurcery, & then drawn forth and planted; it will not indure cold nor moyſture,

The Walnut.

The use and advantage of it.

and seldom any grow in your strong clay land at all; if they be well planted and preserved, they will make a good shady walk, or set in row at a good distance will prosper very well, but they require great room, and good land, it groweth to a great bigness, and is very usefull for any household use, excellent for the joyner, and curious for the Gunsmith, and the fruit thereof is most delightfull and no less profitable.

The Willow.

The willow though *Homer* calls it an unfruitfull Tree, yet I shall ingage much in the praise of it; it is the quickest of all wood for growing, and riseth more in one yeare than many doe in three: And for profit, I must question whether any can or may come neer it; it comes off with less charge than any, and hath a preheminency in lightnese and toughness, and is very serviceable for spades and Gun stocks, and manifold uses more, to be kept dry it will scarce ever decay; It delights in low ground wet and shady, yea the most watery the more suitable, and yet will grow upon a dry bank, and in the Champion also: It is very good for fyring also. It is to be planted of young setts cut off of any bough, about two foot and a halfe long, or somewhat shorter, set or thrust into the soft earth or soft ground, almost any bog being cast up in great lands, and on each side thereof a Trench so deep as to goe a little below the bottom of the bog, and these set a foot and half a sunder in strait liness or else two foot asunder; the sets being thrust into the earth within eight or nine inches of the top; and this to be done in February and beginning of March, and in three or four yeares it will come, if it prosper as it should, to make windings or hurdle wood, in a yeare or two more to make hoppoles, and great sets to bee planted at seven or eight foot length, to be set for Trees about eight or nine foot distance by river sides or little brooks, or more, if you would not have your ground shaded, which must bee secured by stakes or thorn, or some other meanes for two yeares, from rubbing or shaking with wind or cattell; it is conceived, that those planted moyst thrive fasted, but those upon a dry land indureth the longest: bee sure to cut your sets a little aslope

aſlope at the neather end, and ſet the biggeſt end downwards, and cloſe the earth pretty cloſe to it when it is ſet, and cut off all twiggs that come out of any part of the ſet. They may be cut as you have occaſion to uſe them, at three, five, or ſeven yeares.

The Oſier muſt be planted after the ſame manner, from ſhort ſets as aboveſaid, and muſt be planted upon very good land, and then it will yeeld a crop every yeare, and may poſſibly be worth three pound an acre or more: is of eſpeciall uſe for Basket-makers, and fiſhermen for making Leapes and inſtruments to catch fiſh in. The Oſier is quick of growing and very profitable in its uſe, you may plant them where the Sea ebbs and flowes, and covers them all over, for that they have but time now and then to lie dry, they will proſper no leſs there than elſe-where: you may maintain ſome ſtanders here and there of two or three yeares groath, to make big ſplents or ſupporters for your great work. Oſier his uſe and how planted.

The Lime Tree is alſo newly diſcovered as uſefull in our Engliſh Plantations, but it groweth to be of great credit among our Gentry. It thriveth exceeding well upon midling land, makes a fine flouriſhing Tree, and being headed and ſet in walks in roes, makes a very gallant ſhady walke, they beign to be much planted about *London*, *Surrey*, *Kent*, *Eſſex*, &c. It carrieth a very faire ſmooth leafe, ſomewhat like the Beech Tree: And as for the fruit of them, and the manner of planting them, I ſhall ſay no more, but leave each man to his own experience and triall, till I have further experimented them, and ſhall ſay that they are moſt probably exceeding profitable, and what hath been ſaid of other Woods for the manner of planting may in a great meaſure be applyed to this. The Lime tree

So I have done for preſent; Which Particulars, if thou haſt ſeriouſly peruſed, although thou haſt paſſed many things offenſive poſſibly, which hath not been the Authors deſire juſtly to Adminiſter: And if any thing unjuſtly have offended he is very ſorry, and hopes, and verily beleeves, it either ariſeth from want of a clear Repreſentation of his meaning in more Significant Tearmes, or Artificiall Language to the Cauſes why the Reader digeſt not the Diſcourſe.

Readers mis-understanding of the Authors Sense, or mis-conceiving of his way of Practice, which I beleeve upon a second unprejudiced Consideration, will more clearely Represent it self unto him. As for the curiosity in its composure, or Exact Method in the handling, bear with the want thereof, thou must expect no better from a Treatise of this nature, Rudely digested out of Confused Principles and Notions, and from Experiences, most of them Compleated, but some of them in present Practice, which when throughly Experimented, (If these weak Discoveries find exceptance with thee, and shall appear with the least Advantage to the Common Good) if God be pleased to give opportunity, hee may present thee with a second Part to the same Tune; Wherein hee hopes to Compleat or make up the whole Art of Practicall Husbandry, or give thee in a whole New Plantation of Ould *England*.

The Authors promise to mend.

As also something may bee Digested after the uttermost Improvement made upon thy Lands, how to make the best Improvement of thy Stock, to greatest advantage it is possibly able to yeeld thee and the Nation, or what else shall fall into Experience in the *interim* as fit for Publique discovery under the nature of Improvement; Thy loving acceptance hereof and practice therein will undoubtedly Command.

And though I have in some things been too Tedious, which I could not well avoid, yet I hope I have dealt truely with thee, I am sure in my own Experiences, I can make good unto the Eye what I have presented to thy Ear, and what I have also seen as other mens, I have Represented them in Truth as near as my Abilities were able to judge of them or I able to receive their information; Therefore I have acquainted thee where thou mayest discover Truth in all: And if I have taken any thing up, by bare information, it may fail, in some circumstances, but I hope, and doe in good measure know it doth not, nor shall not faile, in the substance thereof; And if I shall heare but make good or clearely hold out a double Improvement, it will be worth acceptance, (to me it hath bee n worthy Respect and Imitation,

tion, when I could but Advance any Land, one half or third part, by any Information) but if I have made out clearly to the Nation the severall opportunities of such vast Improvements, that there is such Lands, and such Capacities to Advance them, as I have held forth in my Title Page, and have also as truly shewed that they have been done already, and may be done for future, with the severall Wayes, Rules, and Means for their Accomplishments: and that also at so rationall, easie, and familiar cost and charges, and principally and chiefly by the Poor Mans labour, who cryes for it, and must have it: I hope I shall not be Accompted, or at least not Scandalized as a Projector, but as a poor and faithfull Servant to his Generation. Farewell.

The Author Clear, his Endeavours are for publique good.

THE *SECOND PART* OF Englands Improvement.

NOw I shall proceed to the Second Part of my Discourse according to my promise, and shall therein endeavour the most clear and candid discoveries of six more Peeces of Improvement; all of them the most advantageous for the Improvement of Land of all sorts, and under all capacities that have yet ever been discovered, some whereof, and very many I yet never read one word of, nor so far as I can find out, or hear, have yet ever been published, unless you please to take that for a Discovery which is by a Subintelligitur, as I conceive Mr. *Speed* that superlative Improver (and

some such others) to whom can they make good but one quarter of what they affirm, they neither can want Money, Clothes, nor Scholars, I know some of the succeeding particulars are the deep mysteries he will impart for composition, and how he came by many of them too, but that they are many of them of his own experience, or to that advance he speaks of, I affirm the contrary; and much fear the news he tels us is too good to be true.

The man I know, and have conversed with him, and have known him some late years, and while his Books were private, and conveyed into Noble, and Gentlemens hands, particularly by himself, and his ovvn Agents, I could bear it, and suffer wiser than my self to bee fooled, because I was not wise enough as to beware of him, but novv they come to be sold in the Stationers shops, and spread abroad the Country, to deceive, and beguile the Nation, I cannot forbear.

He tels us his discoveries are Imethodically distributed, and so they are, just as if you should put a man to his choice, whether if a man would give another as willingly two hundred pounds as one, and would give him the two hundred pounds first too, whether he would chuse the one hundred pounds. So after he hath first told us of a certainty to raise two thousand pounds *per annum*, with less than two hundred pounds stock, which I wonder who will refuse, and close with another of his offers, which is, with five hundred pounds stock, to raise a thousand pouuds *per annum*? which of the two is more probable, yet less desirable than the former, but both of them to be effected with money. Yet me-thinks I could hearken to his fourth particular, which is to discover a way without charge, whereby an industrious man, of a reasonable capacity and fortune, without prejudice or dishonour, may contrive to himself five hundred pounds *per annum*. Himself exceedingly wants such a discovery, or else wants the reasonable capacity he speaks of; for sure the fortune he speaks of he cannot want, being a man of so vast a mind, large understanding, and great experience, unless his experiences have eaten away the rest, which to me seems

ſeems unprobable, unleſs they be to be found viſible. Theſe things are gallant in contemplation, but more ſadly experimented, which you will hardly find by ſea or land, nor any other place but Mr. *Speeds* chamber, I beleeve.

He tels us by his fourth *Item*, that with leſs than fifty pounds ſtock viſible, a man may advance a thouſand pounds *per annum*; but I fear either the Inviſible muſt be ten thouſand pounds, or elſe his thouſand pound will drop ſhort by nine hundred and eighty; and if you grant him credence, or that there were a poſſibility in him ever to effect it, vvhy ſhould any man ſo much abuſe himſelf as to make uſe of his following *Item*, which is with two hundred pounds ſtock in three years to raiſe four hundred pounds, and in three more double the four hundred pounds, *&c.* The which hee affirms but in probability, and yet the other upon certainty; but that of probability may be, and is moſt evidently experimented, and was by thouſands before Mr. *Speed* was born; but why any man ſhould lay out two hundred pounds, when with fifty pounds he may raiſe a hundred and ſixty times as much therewith. I wonder far greater than thoſe he holds forth in points of Husbandry as to advance land two hundred fold, from five ſhillings to fifty pounds *per annum*, &c. and many more, in all which I ſhall ſay no more, but refer thee to his Book, and his perſonall Diſcoveries; for I muſt, and will lay him down the Gantlet: For there is enough to advance the Common-wealth, if not to choak it; for many times when men are brought extreme low, either by ſickneſs or pennury, and reſtored, as this Common-wealth is, ſuddenly to plenty, or a good ſtomach, ſurfeit and undo themſelves ſuddenlier with plentie, than by a ſparer dyet, or a more moderate condition; and ſo I fear may this Nation, if they embrace ſo high diſcoveries too haſtily; yet embrace them I pray, but with ſobriety: and remember him alſo that ran mad upon the beholding of his great Treaſure; for ſuch variety of *Extraordinaries* may make men wild, and run from one to another, not knowing where to cloſe nor ſtay, and the gazing after theſe Princely Incomes, if they look after it till effected, may make them look

His book is but to draw thee to his chamber to tel thy fortune there.

look their eyes out also; but enough hereof.

Yet let me lament the sad condition of our Times, and I fear the neglect of our Goverument too; for to very many members thereof, if not to all, he hath given his Bookes, whose fault with humble submission it is, that so great discoveries should still be clouded, and yet not put in practice, and the Common-wealth thus bleeding, while either by a Patent, or rather, and that m sure for the value of one or two dayes pay at most of a common Clerk in some Offices would effect it; for truly the man is very conscionable, and desires not a full condition, but chuseth a very mean one, and will accept of too little in all conscience for his discoveries.

I know to whom hee made many of them, and would have done all the rest for less than twenty shillings, if the mans patience would have received them, but most like he not being able to bear them, neglected the embracing of them.

And whether I have, and shall speak forth any of the things he means, I will not be peremptory, but beleeve I have, and shall most of them if opportunity last, but shall never endeavour to hold them forth in that Luciferous, yet watery lustre, lest it blind my Reader, but truly and nakedly to discover them, their nature and use, with what reall and feacible advantage may be made thereof, which will satisfie a sober spirit; and if by chance I make a discovery of what is concealed, much good may it doe the Common-wealth, for I shall reap the fruit of my design, *An opportunity to discover publique Advantages.* And whosoever desires cordially to be informed of Mr. *Speed*, may from Mr. *Samuel Hartlib*, dwelling against *Charing-Cross*, vvho can give fuller and larger description both of the man and his abilities, having expressed himself so far a Gentleman of such charity towards him, as he hath maintained him divers moneths together while he was inventing some of these his discoveries as I was informedfrom a very knowing Information.

CHAP.

And now to the ſix Peeces of Improvement contained in the enſuing diſcourſe, held forth under theſe Heads.

1 *By ſowing the Trefoyle or Claver; and St. Foyne, and the and the advantages hereby.*
2 *By facilitating the great charge and burthen of the Plough, with the Figures of them.*
3 *The planting of Weld, Woad, and Madder; three great dying commodities.*
4 *The planting of Hops, Safforn, and Liquoriſh, and the profits thereof.*
5 *The planting of Rape, Coleſeed, Hemp, and Flax, and their Increaſe.*
6 *The Improvements that may be made by ſome Orchard and Garden fruits.*

CHAP. XXVI.

Contains the beſt way of planting the Trefoyle or great Claver Graſs, which is the higheſt advantage our Engliſh Lands will produce.

And herein I will diſcover the beſt ſeed, and the beſt means to gain it, how to ſow and husbandry it for food and ſeed, with the moſt ſuitable land thereto, and the profit that may accrew thereby; and for brevity ſake ſhall ſpeak little to what other publique ſpirits have diſcovered, but enlarge a little from later experience in relation to our Engliſh Lands and Husbandry.

THere are ſo many ſorts of Claver, as would fil a volume, I ſhall only ſpeak of the great Claver, or Trefoyl we fetch from *Flaunders* called by *Cluſius, Trifolliummajus tertium*, which bares the great red Honyſuckle, whoſe leaf & branches far exceeds our natural Meadow Claver; it bears a very ſmall ſeed as Muſtard ſeed, not ſo rouud but longer like a Bean; the beſt is of a greeniſh yellow colour, ſome a little reddiſh, but the black I fear will not do well. The

Seed deſcribed.

Right ſeed is the beſt peece in the whole work.

choice whereof is the only peece in the whole work.

Your *Dutch*, *Holland*, or *Low Country* Seed, or from the lower parts of *Germany*, is very much of it very hazardous that comes over hither, but being well chose there, the transporting of it by sea is no considerable prejudice unto it, but much that is sold in the Seed-mens shops in *London* was either corrupted by the *Dutch* before it came thence, or else parched by over-drying, or else by the Shop-keepers, either mingling old and new, or keeping it another year, and then selling it for new: I my self within this four year sowed divers Acres with Seed bought in *London*, which cost me about two shillings a pound, and lost it all; I am not able to say any one seed came up at all. And I have heard that the *Dutch* out of an evill spirit, lest we should find the same benefit they have, have kiln-dryed it. Therefore my advice is, to send over a knowing man that hath had experience of it, and knows the right coloured Seed to buy, and search all the Country and buy the best and choicest Seed he can possibly buy for Silver, and take care of the bringing of it over too; and as for the sale of it, if you bring over more than you shall use, you need not, nor shall not want customers to take it off of hand; for I had rather give a double price for such, than run the hazard of common Merchants experience.

Claver sowed but none came up.

But if you desire me to speak my mind from the experience my self hath made, I doe affirm that our own Seed, that is, Seed of our own Claver, after the first sowing of the the *Dutch* Seed, called the great Claver, is the best, and most certain Seed to grow, and so successively from time to time, if you can ripen it kindly, get it dry, and preserve it. And this will bring me to my second particular.

The best is of our own growing.

2 Which is how to get good Seed, or recover itout of our ovvnCrop to sow again, if you could get it kindly out of the husk, which to us as yet is a mystery, and we cannot do it artificially and feacibly, as they do in *Flaunders*. The best means we do use is to thrash it out of the straw; and then chave it or clense it from the straw, as you do corn, and then polt it, or faulter it as some call it, that is, beat it over again in the husk, and then get out as much of the re-

fuse

fuſe by chaving of it with a narrow toothed Rake as poſſibly you can get; which done, if you would beſtow funning of it in a hot dry ſeaſon, and then rubbing of it, will get very much of it, for this is all the means that hitherto I have ever heard of in *England*, but I am confident that it may be very feacibly got forth of the husk, being very throughly dryed in the Sun, upon a Corn-mill, Oatmeal, or Maultmill, and ſhelled as they do Oats, by a skilfull Miller, and no ſeed hurt as they will Oats, and not break the kernel, having his Mill-ſtones exceeding levell hung, neither too ſharp nor too dull, and very curiouſly ſet that it cut not the ſeed, nor yet leave too much ſeed behind; which if it prove, as I am confident it will, it will be a very great advantage to the Nation. This upon the very writing hereof came into my mind, which I am very confident of the performance of the work, and reſolve to make the experience thereof, if God bleſs my Crop of Calver this ſummer. So far as I have hitherto ſeen or heard, our own ſeed ſowed in the husk, hath proved the beſt, thicker and certainer than that ſowed of the pure ſeed it ſelf, and ſo ſhall fall into the third particular.

I have heard of one that got above 2 buſhels out of an Acre.

A new way of getting out the Clover forth of the husk.

The beſt way of ſowing of it, and I do verily beleeve, that if the husk be but once cut and ſhivered a little that the Seed may but ſcatter, that it may be beſt to ſow it with the husk or chaff, becauſe it ſupplies the filling of the hand better than any thing I can finde out will do, with theſe two Obſervations.

3

1 That you be ſure to find out a fit proportion of husk and ſeed together to ſow an Acre, and that I cannot preſcribe, unleſs I knew how clean you could make it; your own experience will diſcover that perfectly.

2 That you be ſure ever and anon to ſtir up the bottom of your Hopper, or Seed-lop, becauſe the Seed will ſink downward, and keep your ſeed and chaff alwayes in an even mixture and compoſition, leſt you ſow that part thicker in the bottom than that that lay overmoſt; but ſhould you fail of purifying the ſeed from the chaff for private uſe, it may do beſt of all, if the hopbowl or husk be but cut and

shattered as aforesayd: but if you sow that Durch seed, as that you must of necessity till you get into stock of seed of your own, then the best way of sowing it must be by mixing of it with Ashes of wood, or coal coarsly sifted, or with saw-dust, or good sand, or fine mould, or any thing else that will help to fil the hand, & wil spread wel forth of the hand, but I like not well the taking it up betwixt the fingers & the thumb, or the two fore fingers and the thumb, because they cannot scatter the seed so broad nor so even as they can out of their full hand. And this I must press as one of the most weightiest things in this Husbandry; to have a most especiall care of the even sowing of it, your care herein must be far more than in sowing Corn for these Reasons.

1 Because the Corn with much harrowing (which this will not abide) though uneven sowed will be drawn into wants and uneven places, and much regulated by the Harrow.

2 Because your Corn is of a heavier, and fuller, and weightier substance, and will spread well of it self, but this is so small and so little in bulk, sowes a land that it cannot be discerned how it spreads, and whether even or uneven.

Best time to sow Claver.

3 Because the wind, though very small, hath power over this, and not over the other, and how ever you must chuse a calm time as possibly you can, many times early in the morning, or late at evening are your calmest times. You may sow it upon any Land you intend to graze upon, any bare places in a Meadow or highwayes trodden and poched, and it will soard them; but the usuall way is thus advised, when you have fitted your land by Tillage and good Husbandry, then sow your Barley or Oats, and Harrow them in, and after your Claver upon the same Land, and covered once with a small Harrow or Bush, but sow not the Corn so thick as you usually did, but if you will lose this Crop, you may sow it of it self.

And lastly, because if your Corn should miscarry, it is but for one year; but this for many: and as you sow once you must often reap, and will never cover or soard kindly, if

evenness

evenneſs be not effected, to the compleating of which you muſt have a ſober ſtaied Seedſman, that carries his hand high, takes his ſteps even, and delivers his ſeed out of his hand at one equall and conſtant bredth and wideneſs. It is my conſtant cry to my own Husbandmen to take heed of Plough-balking, and Harrow-balking, but now I ſay in a more eſpeciall manner, take heed of Seed-balking. The beſt ſeaſon for it is in the beginning of *April*, or in the end of *March* rather, if it be likely to be a dry ſeaſon; late ſowing may do in a fruitfull ſeaſon, but yearly is moſt certain.

The fourth particular is how to preſerve it, and mow it, and make it moſt uſefull for Seed and ſervice. I have heard much talk of three Crops, and truly if it be not reſerved for ſeed, I am confident in a fruitfull year it will well bear it, nay may be more; for though I love not fauning, neither affect I ſmothering the Truth, nor to ecclipſe any new diſcovery, I therefore ſay that if the Seed be good, and the Land either good naturall, or artificially made good by Husbandry, it may very well bear three Crops, two to cut, and one to graze, and the firſt Crop may by mid-*May* bee ready to cut; for this I ſay, and moſt will find it, though they otherwiſe ſpeak high, that this graſs will be beſt alway to be cut green, and before the ſtalk begin to grow too big, & begin to dye and whither, unleſs it be for ſeed: Therfore, as experience will teach, it will be excellent good to cut it green and young, and give it cattle or horſe in the houſe; for if you cut it to keep, it will go ſo near together, as it will do but little ſervice dry, yet being cut young it will be very good and ſweet, and either feed or give milk abundantly; and then after the firſt cut, let it grow for Seed, and herein you muſt be carefull that it grow till it be full ripe, for it will not be very apt to ſhed. And if it grow to ſeed, I cannot conceive of what uſe thoſe ſtalks which are ſo hard and dry can be of, unleſs it be for firing in a dear Country, ſo that the ſeed muſt be the advance of that Crop onely; and ſo it may well enough, and you may have a good after-paſture, and may graſe it untill *January*, and then pre-

4

To know when it is full ripe.

preserve it; but if you would know when your Seed is ripe, observe these two particulars.

First observe the husk, and when the Seed first appears in it, then about one moneth after it may be ripe.

But Secondly, try the seed after it begins to turn the colour, and the stalk begins to dye and turn brown, it begins to ripen, and being turned to a yellowish colour, in a dry time mow it, and preserve it till it be perfectly dry any manner of way, and then about the middest of *March* Thrash it and cleanse it from the straw as much as you can, and then foulter and beat the husk again being exceeding well dryed in the Sun after the first thrashing; and then get out what seed you can, and after try what a Mill will do at the rest, as aforesaid more at large; but I will give way to a better Discovery. I need not prescribe a time either in *July* or *August* as best to cut for seed, because some years and lands will ripen it sooner than other will; therefore have respect to thy seed and straw according to former directions; but when thou art got into good seed, thou mayst graze it upon thy land, and then be sure not to let it grow too rank and high; for if the stalk grow big cattell will balk it and stain it more, and it will not eat up so kindly at first, nor grase so even afterward, but exceeding much Milk it will yeeld, and feed very well, but to affirm as some have done, and doe confidently unto this day, that it will grow upon the barrenest ground as is on *Windsor* Forrest I dare not; I have known that there it hath failed; and I am confident must, without exceeding great cost and husbandry, yet that very Land well Manured and Tilled, Dunged, Limed, Marled, or Chalked, or otherwise made fat and warm, will bring forth good Clover, and other rich commodities, as they do in *Flaunders*, upon so coarse Lands bestow good cost, and that will do: The nature of the Land is good, but the spirit of it is too low to raise it of it self. And this is all is held forth in the discourse of the *Brabant* Husbandry, exceeding barren Lands, but well Dunged and Tilled, and then Clavered; not that it is the barren Land, but the good and costly Husbandry; onely the oldness of the Land, and restiness thereof

When and how to get out the seed.

Yeelds much Milk, and feeds fat Beef.

A great mistake about Claver.

thereof yeelds more ſpirit to the Grain or Claver by far than the Tillable Land conſtantly ploughed, and being of the ſame fatneſs and barrenneſs, and no better; yet I verily affirm that Tillable Land well husbanded, and layd down with Claver, will do very well alſo. The quantity of Seed to ſow an Acre, as I conceive, will be a Gallon, or 9 or 10 pound, though ſome are of opinion leſs will ſerve turn. And ſo I deſcend to my laſt particular, which is,

Old land better for Claver than tillable.

How much ſeed ſoweth an Acre

5 To ſet forth the Lands moſt ſuitable for Claver, vvith the Annuall Profit that comes thereby.

Therefore, as above, I ſay your old Land, be it coarſe or rich, as it is, or hath been diſuſed from Tillage long, is beſt for Corn; ſo alſo is it the beſt and certain Land to Claver; and when you have corned your Land as much as you intend, then to alter it to Claver is the propereſt ſeaſon.

The lands moſt proper for the Clover.

1 As to the nature of the Land, as I conceive your dry, warm Land, naturally good, betwixt ten and twenty ſhillings an Acre, or your poorer dry Land, betwixt one ſhilling to ten ſhillings an Acre, well manured or ſoyled, and brought into perfect Tillage; and to ſpeak properly and plainly, any Land that will bear god Corn, will bare good Claver.

2 Your earthy, well mixed Land, of a middle temper, will do with good Husbandry, as aforeſaid, as well as the former.

And laſtly your naturall cold Land, well Husbandryed, layd up very dry and warm, and brought into good Tillage, every Land layd high, as the nature and coldneſs of the Land requires, and every furlong drained, and the furrows cleanſed up by the Plough at laſt, will bring almoſt any Lands into a very good condition for Claver, and the better husbandried the better for this uſe alſo.

A generall rule in Clavering.

This I ſhall lay down for a generall Rule, that whatever Land is neither too rank or fat for any ſort of Corn whatſoever, is not too good to Claver, and you ſhall alway find it beſt Husbandry, and beſt profit upon your beſt Land, unleſs, as aforeſaid, you recover the barren Lands up to a good

and

and rich condition, which is also the far better Husbandry than to lie pelting and moyling upon poor mean Land unfatned by some soyls or other, therefore I advise every man to plough up no more than he can exceeding well overcome by his purse and husbandry, and let the rest lie till he have brought up his other, and then as he hath raised one part take up another, and lay down that to grase, either with Clover or otherwise: And let him that flatters himself to raise good Clover, upon barren heathy Land otherwise than as aforesayd, pull down his Plumes after two or three years experience, unless he devise a new way of Husbandry.

The Annuall Profit of Clover Grass.

And as to the Annuall Profit that may accrew thereby, I shall little differ from the *Flaunders* Husbandry, but shall affirm that one Acre after the Corn is cut, the very next year if it be well Husbandryed, and kind thick Claver, may be worth twenty Marks, or twelve pound, and so downward as it degenerates weaker, less worth. In *Brabant* they speak of keeping four Cows Winter and Summer, some cut and layd up for fodder, others cut and eaten green; but I have credibly heard of some in *England*, that upon about one Acre have kept four Coach horses, and more all Summer long, but if it keep but two Cows, it is advantage enough upon such Lands as never kept one: But I conceive best for us, untill we be come into a stock of Seed, to mow the first Crop in the middest or end of *May*, and lay that up for hay, although it will go very near together, yet if it grow not too strong, it will be exceeding good and rich, and feed any thing, and reserve the next for Seed: And if we can bring it up to perfect seed, and it will but yeeld four bushels upon an Acre, it will amount to more than I speak of by far, every bushel being worth three or four pound a bushel; and then the after math, or eadish that year may put up three midling Runts upon an Acre, and feed them up: all which layd together will make up an Improvement sufficient, and yet this property it hath also; that after the three or four first years of Cloveirng, it will so frame the earth, that it will be very fit to Corn again, which will be a very great advantage: First to corn your land, which usually yeelds a far better

Clover fits for corning, and corning for clovering.

better profit than graſing, and ſometimes a double profit, and ſometimes more, near a treble profit, and then to Clover it again, which wil afford a treble, fourfold yea 10 or 12 fold Advance, if not more. And ſo if you conſider one Acre of land with the Claver and Husbandry thereof, may ſtand you the firſt year in twenty five ſhillings, the three other years not above ten ſhillings, the Land being worth no more, which may produce you yearly, eaſily five, ſix, or eight pound *per annum per* Acre; nay ſome will affirm ten, or twelve pound or more; then moſt of my Improvements promiſed are made good, as in my Frontiſpiece is held forth under this firſt Piece of Improventent.

CHAP. XXVII.

Speaks of the uſage of St. Foyne *and* La-lucern.

I Proceed to the diſcovering of the uſe and advantage of St. Foyne a French Graſs, of which I muſt uſe plain dealing, and not put my Reader upon improbable Experiments, as is my chiefeſt aym. And as in ſome part of my former diſcourſe I promiſed to bring down to our practice ſome Out-landiſh Experiments which were hinted at and diſcovered unto Mr. *Hartlib* by Letter to be a great deficiencie to us in our Improvements the non-practice thereof; ſo I muſt, and will hold forth no more than I can make proof of to the face of the world. Therefore my ſelf having not made a full Experiment thereof, only I have ſowed of it this year, ſhall give the relation of the manner of the Husbandry thereof, and the fruit you may rationally expect, and the Lands upon which it is to be ſowen, and ſo leave it and you to your own experience and Gods bleſſing.

I ſhall not trouble you with the deſcription of it as an Herbaliſt, becauſe as in this, ſo in no other is it my deſign to ſearch out the nature of any Herb or Plant in it ſelf, but

as it is most profitable or usefull for my main design, *The Improvement of Land.*

The description of St. Foyne.

St. Foyne is a French Grass much sowed there, upon their barren, dry, hasky Lands, and sometimes in our Gardens hath a kind of it been much sowed, called the French Hony-suckel; it is of one excellent property, yeeldeth abundance of Milk, and upon that account may be very advantageous to many parts of the Nation: it groweth best as it is sayd, upon the barreneſt lands, hilly and mountainous, which I am induced to beleeve upon this score, because it is rendred to be worth but nine or ten shillings an Acre, which some would not think worth experimenting, but if so, and it will grow upon our worst land, I am sure there is thousand thousands of Acres in *England*, not worth one shilling an Acre, and if that being sown upon such land it will with one sowing advance it to that worth, and so continue for divers years, it is very well worth our imitation and practice; it will raise betwixt a load and a half, and two load of an Acre: Besides it is rendred to have another excellent quality, which is not to barrenize Land, but to better or fatten it, and after seven years growing it so roots, large, and many, somewhat like Licorish, that the Plowing up of them, is a very good soyl, and much fattens the Land for Corn: it is excellent for soarding Land the first year a great advantage. It hath been sowed in divers parts of *England*, as in *Cobham* Park in *Kent*, &c. where it thrived very well upon chalkie dry banks.

The seed is first to be had out of *France*, where it is sold for about three pence or a groat a pound, but here it was sold very dear, at nine pence, ten pence, or twelve pence a pound this year. It is most like a Parsnip seed, only a little browner in colour, and somewhat rounder and fuller made like an Oyster, it is very light, and so many pounds go to a strike, and it must be sowed far more in quantity than you do the Claver seed, because it is so great a seed; for ever the smaller the seed the further it goeth: I conceive for every pound of Claver you sow, you had need sow two of this, if not more; but I leave it to your own experience,

you

you will eaſily find a fitting proportion upon the firſt try-all; but the thicker the cloſer it grows, and ſtocks the ground the better, and deſtroyes other ſeed or weeds.

The manner of ſowing it may be with Oats or Barly, and ſo much as grows up with the Barly may be cut up with it, and then preſerved, or elſe if it be very fruitful, it may be moed in the later end of the year, and then preſerve it for mowing for ſix or ſeven years after; for by that time it will have loſt the ſpirit of it, and be overcome by our Engliſh graſſes; and then be fitter to plough for Corn again. The manner of ſowing it.

But if men will be at charge, the beſt way commended to me is this, to prepare your Lands, and make them fine, as when you ſow barley, and then how in theſe ſeeds as the great Gardeners do their Peaſe, yet not altogether at ſo great a diſtance; but yet let them make their ranges near a foot diſtance one betwixt another, and the graſs will flouriſh like Peaſe, eſpecially if they draw the how through them once, or twice that ſummer to deſtroy all the weeds; but whereas he ſpeaks of uſing the great Claver thus alſo, I am ſomewhat jealous he is miſtaken herein, becauſe the thicker it grows and the cloſer, with one continued thickneſs, the better either to mow or graſe. The experimenting I leave to thee.

There is alſo the La-lucern, another French Graſs, which is excellent Fodder, and is rather preferred before the St. Foyne, and it is advantageous to dry and barren lands, and hath been lately diſcovered there, and is now of great credit amongſt them, but for my own particular experience, I can ſay little, and therefore ſay thus much, only to provoke the Ingenious both unto the ſearch, experimenting, and communicating to publick view, nor one man being ſufficient for the experimenting of all diſcoveries that may be made here, and elſwhere, I am confident every Age, nay every day will bring forth ſomething or other worth our embracements. La-lucern.

The Second Generall Peece of Improvement contains the discourse of facilitating the charge and burden of the Plough, and a demonstration of the Figures thereof.

CHAP. XXVIII.

Discovers the severall Abuses of the Plough.

BEfore I proceed in this discourse, I will lay down these two or three Maxims or Conclusions.

First, that whatever moveth upon the Land, or that worketh in the Land, and carrieth the least earth or weight with it, must needs move or work easiest. A wheel the lesser ground it stands upon, the easier it turns, and the lesser the wheel the easier still; so the Plough, the more earth or weight it carries with it, the more strength must be required. The naturall furrow it must carry, but the lesser compass both in height and length it bears upon the Plough, the easier the Plough must go.

Secondly, the more naturally any thing moves, the more easily, and the more Artificially, the more difficultly.

Thirdly, the sharper or thinner is any tool, the easier it pierceth, and the less strength is required; so contrary, the thicker or duller any tool is, the more strength must work it; and;

Fourthly,

Fourthly, that which is the plaineſt and trueſt to the Rule, and admits of leaſt multiplication of work, muſt needs be eaſieſt.

All my endeavours ſhall onely be the application of all theſe to the Plough, and that as naturally as I can by truth of Workmanſhip, to diſcover the Plough and Plough-Irons to the moſt exactneſs, which will be all the eaſe that I can give it, or any man yet ever did or could: If any other ſhall endeavour to diſcover by Engine or otherwiſe, to ſupply the ſtrength of horſe and man to draw the Plough, I know an eaſie Plough will go more eaſie, and ſhall therein rejoice.

And becauſe I find ſo many different names given to the members of the Plough according to the Country phrazes, & few of one Country underſtands another Countries terms, I ſhall confine my ſelf to one name to each member all along my diſcourſe, for the better underſtanding of the Reader.

As for the Plough-ſheath, Wreſt, Beam, Share, and Coulter, they retain theſe names clearly in moſt parts, and ſo I ſhall continue them.

But for the Plough-handles, ſome call them Stilts, and ſome Hales, and ſome Staves, I ſhall confine my ſelf to the name of Handles.

For the Plough-head, ſome call them the Plough throck, ſome the Plough-chip, *&c.* I ſhall retain the tearm of Plough-head.

And the Shield-board, ſome call Breaſt-board, or Earth-board, or Furrow-board, I ſhall retain the Shield-board.

And for the Coumb, or Whing of the Share, which is that which goeth upward upon the Shield-board, I ſhall tearm the Coumb.

And for the Tuſh or Phin of the Share, which is that that cutteth out the bottom of the Furrow as the Fiſh doth divide the water, I ſhall call it the Phin of the Share, and ſo I ſhall avoyd multiplication of tearms, and a little ſhorten and clear my diſcourſe, and ſo proceed.

As for the giving an addition of eaſe unto an ordinary,

ry way of Ploughing, and the taking away of some of the strength which is so great a burthen to the Husbandman, is of very vast concernment, and will take up a very large discourse; the effecting whereof I shall endeavour under these following heads.

1 To discover the severall abuses or hinderances to the well-going of the Plough, with some remedies thereto.

2 To give you the descriptions, with the Figures of severall sorts of Ploughs now in use.

3 To demonstrate wherein the chief ease of the Plough consists, with the easiest gowing Plough, and the advantage gained thereby.

4 To discover to what sorts of Land and seasons of plowing each Plough is most sutable, with a double Plough yet unknown, and a plough that shall both plow and harrow a once.

The Abuses or hinderances to be removed are many, wherein I shall speak to particular abuses only.

1 Plough Irons made very true

And first abuse: I shall speak to particular abuses only prejudicial to the Ploughs easie going in the Blacksmith, or he that makes the Irons for the Plough, I not being of the opinion as many are, that the Irons should be made to the Plough, but that the Plough be made to the Irons; I therefore shall be bold to say, that if Plough Irons be not made exceeding true in all points, according to the Land you have to plow, and wrought fair and smooth, a Plough-wright or Plough-maker shall not, nor cannot work true to a false foundation; and if it be not wrought true, it shall hardly go true, unless after much wearing, being wrought into work, it may plow reasonable well at last, and by that time the Plough may be worn out, but never with that ease, nor continuance as it would by Truth of Workmanship: Another abuse in him is the not steeling his Plough-Irons well, and making them exceeding sharp and well pointed.

2 The second abuse is in the Plough-maker, who works according to certain coarse Rules he hath learned by trade, knows not how to hold a Plough himself, nor to apply himself

ſelf to the nature of the Land, or according to the alteration of it, nor ſcarce is able to diſcern the falſity of the Smiths workmanſhip; and is not able to apply himſelf to all ſorts of Lands, or thoſe ſeverall ſorts of Tilths the Husband man gives, he ſhall never make a Plough to go with eaſe by his rules, unleſs he chop upon it by chance.

The third abuſe may be in the Plough-holder, and if he have not abilities to order his Plough, to fix and alter his Irons, and his Plough too, according to the ſeverall natures of Lands he ploweth, and according to the manner of his plowing, and keep his Irons in a true and keen poſture: ſometime he is to caſt down his Land, ſometime to raiſe up, and ſometime to plough up hill and down, ſometime even levell Grounds, in all which if he have not ſome good experience, though both Smith and Plough-wrights do their parts, yet becauſe the Plough-holder cannot be made aswell as the Plough, many good Ploughs are utterly ſpoyled in the uſage or abuſage. 3

May be in the Lands, when the Lands as ſome almoſt at any time, or with any Ploughs are notworkable; or when Land is over-wet or over-dry: now all Ploughs are not to go upon all Lands, nor at al times, but men muſt be ſo knowing, as to have their ſeverall Ploughs for each ſort of Land and ſeaſons, otherwiſe they will moyl horſe, men, and ploughs unſpeakably. 4

Now as to the diſcovering ſome remedies or cures againſt theſe abuſes, and firſt as to the Smith, his Truth of Workmanſhip lieth chief in theſe three materials of the Plough, 1 the Share, 2 the Coulter, 3 the Shield or Breaſt-plate (as ſome call them) Shivers: All which they being made true, and according to the naturall caſt of the furrow, that ſo the earth ſtick not upon the Plough, but the Irons wear bright and clean, it is a good ſign of the truth of Workmanſhip on his part. I ſhall onely preſcribe theſe particulars for the advantage of the Share; if it be a Share made with a pan to put upon a wooden head, then I do adviſe the pan be made prety deep, and ſomwhat deeper than our ordinary Shares are made, but not too large or wide a pan in bredth, and the phin- The remedies of the ploughs abuſes.

phin made broad, descending or whelming to the right hand; it hath these two advantages; first the deeper the pan is, the thicker and stronger may the head be put on, and the longer it will last.

A description of the plain Share.

2 The Tush or Phin of the Share will whelm the more being set down to the work which is the Levell or bottom of the head, or rather a little lower, which will give great advantage to it of clearing the earth at the throat, or first entrance upon the nose of the Shield-board with more ease, for if it stick there, it will be gone all along the Plough at once. A Share made most hanging from the very nose of the Breast-board, and not flat as most are; the figure whereof could I describe it like the side of a hill into a level meddow, would give a perfect demonstration of it, which I shall endeavour as near as I can; it should be pitched or set upon the Plough-head somewhat hanging also on the right hand, and the Plough-head pitched hanging also. As for the bredth of it, I leave that to each mans experience as his land requires; if upon a stony land, or twichy woody land, it must be narower, and the more flinty the narrower; but if it be upon a gravelly, it may encrease in bredth, and so it may upon a clay, and more upon a mixed earth, and more upon a pure earth or sand, and most of all upon the Lay-turf, however upon all I would have it cut up very cleanly the full bredth of the furrow thou carriest with thee, and not rend and tear it up with the bredth of the Plough, which increaseth the weight and strength; and most Ploughs are guilty of this inconvenience, especially where they go with their narrow long pointed shares.

But now if you demand whether it be best to have the Coumb or Wing fixed to the Share, or put into the Share with a hole through and Riveted below, or whether to have none at all, but onely a shiver or plate upon the Breast or Shield-board, placed curiously upon the Share, exceeding tite, and as closely filed and wrought to the Share-pan as may be.

I answer, first, that could you have the Coumb or Wing so fixed, welded, or wrought solidly to the Share, with its true

true whelming, hollow, croſs winding, compaſs, juſt anſwering the caſt or turn of the furrow, which cannot be deſcribed by a Figure: this being wrought fair and ſmooth, and as broad as poſſible you can get it, will be the beſt. And this is reaſonable well done in many parts of *Hartfordſhire*, in ſome parts of *Northamptonſhire*, and *Bedfordſhire*, and in many other parts, onely the Wing or Coumb is not broad enough; but the beſt pattern for this is upon the Baſtard-Dutch Ploughs, who work them ſo broad, as they cover all the noſe of the Breaſt-board, eight or nine inches broad, and twelve or thirteen inches high, and give the trueſt compaſs of any: I have ſeen of this faſhion in *Holland* in *Lincolnſhire*, and many there are of them upon the Marſhes and Sea-coſt of *Lincolnſhire*, *Norfolk*, *Suffolk*, and *Eſſex*, where the Dutch Plough is much uſed, but the true Dutch ſhare is otherwiſe ſo coſtly, and made eſpecially for boggy ſoft land, very troubleſome and curious to be wrought, and more curious to be kept, and by our Countrey men the nicety of it will not be endured, nor indeed will it work in moſt part of our Country Lands, and therefore I forbear further incouragement thereto, than to this ſmall branch thereof. The weelding compaſs of the Coumb.

But as to the fixing or weelding on the Coumb, I ſtand indifferent, becauſe I think there is another way as good and eaſie, however let the Share without the Coumb be made as aforeſayd, and then with a Shiner or Breaſt-plate curiouſly wrought a little hollowiſh at the noſe, and ſo continuing along, being placed ſo cloſe to the Share, that graſs, ſtraw, roots, or weeds get not betwixt it and the Share to choak it in the Breaſt, for then it is utterly ſpoyled of its eaſe: the Shiner will do beſt to be continued all along the Breaſt-board one ſolid plate compaſſed and croſs winding from the middle; the over end forward looking one vvay towards the Land, and the over end backward towards the furrow; and ſo muſt all your Shield or Breaſt-boards be hewen or ſawen, and compaſſed with fire, and wrought fair or ſmooth afterward. This Shiner if wrought fair, as high as the earth works upon the plough, and have his true com-

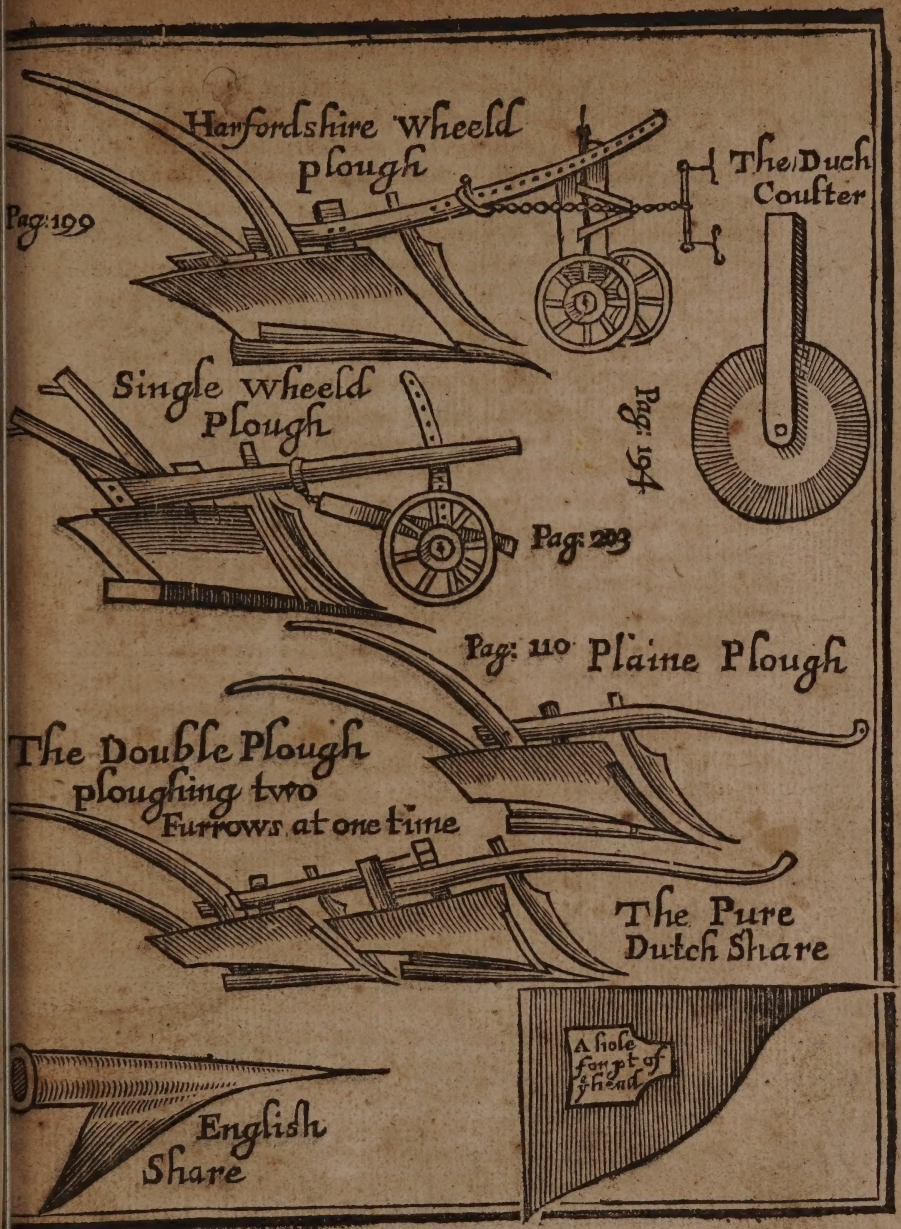
pass with the Breast-board, may also be of excellent ease to the plough; for after it hath gon, and is scoured bright, the earth will slip off, and pass away with much ease, and will carry no earth at all, which is to the great ease of the plough; and both these are better than a Coumb put through the Share-pan, and so come up along the nose of the Shield-board, and their nailed to strengthen the neck of the plough, or else put up into the plough-beam to strengthen it either; yet this I also prefer before those that have neither this, nor the aforesaid helps. And as for other fashioned Shares, whether made to the single wheeled plough, or to the double wheeled plough, whether with a pan, or without a pan, it matters not, so that at the first entrance of the earth, it be rightly compassed, and cast for the cleanly turning over the furrow, and the Share point made very small, sharp, and well steeled, be it long or short.

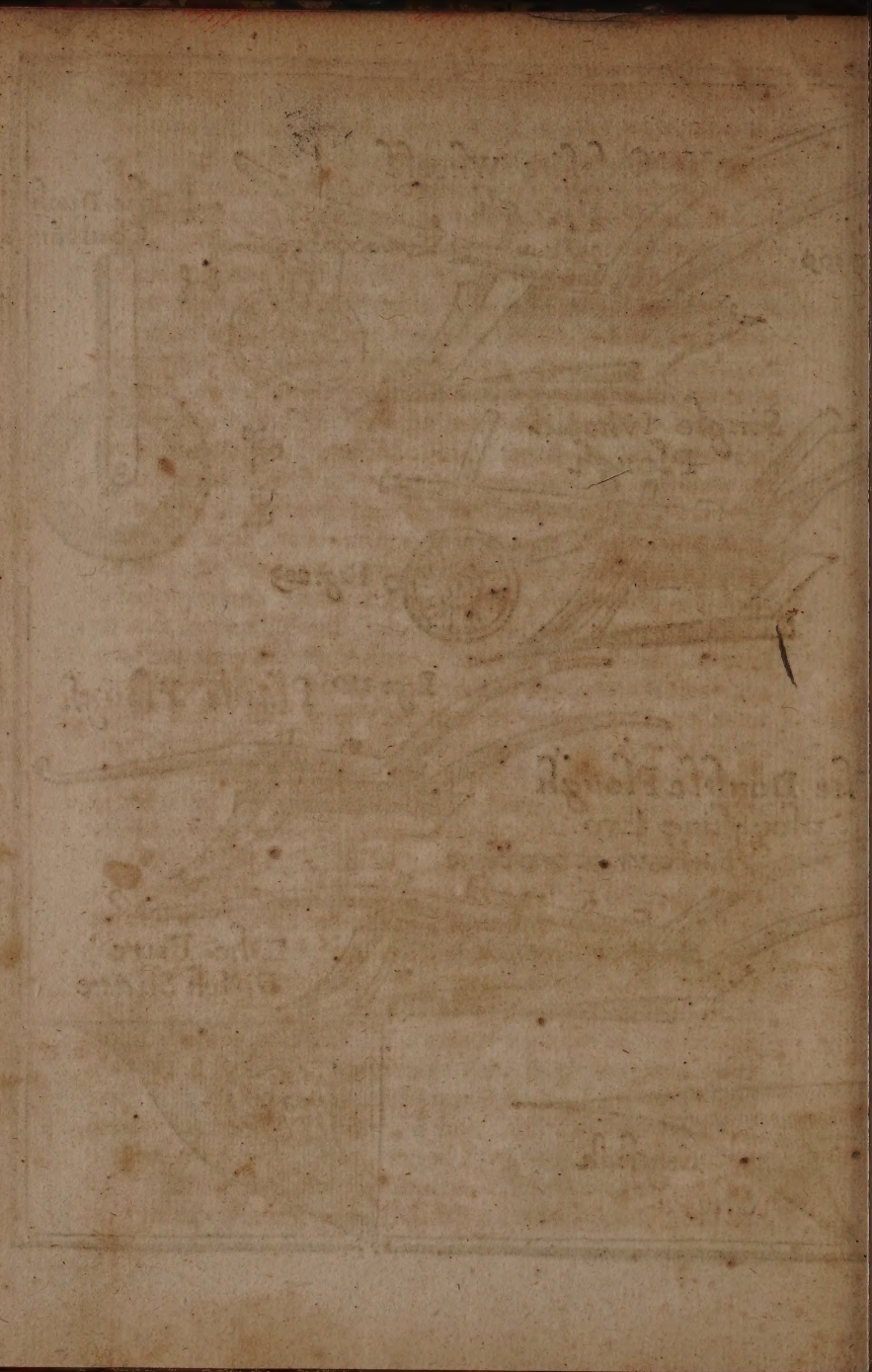
The Coulter how best made

2 As to the Coulter, his truth of Workmanship lyeth in this, whether it be Dutch or English Coulter, that it be well steeled and wrought sharp and thin on the edge, the point also looking forward, if English, and the edge alway placed just forward, neither carving, or turning towards the Land, for that will alway be apt to draw the plough too wide, nor yet into the furrow, for that will be alway apt to work it to go too narrow, but just straight forward by a straight line to the pitch of the plough; but if a Dutch Coulter, then the wheel to be very well steeled, and about ten inches high, and to goe as true as possible; for the false cutting of the wheel will make you work at a great uncertainty, which Coulter is not usefull neither upon stony, gravelly, flinty, broomy, gossy, or rooty ground, but upon pure turf, or pure mould, on which it goeth very easie.

The Dutch Coulter.

The midst of the wheel had near be an inch thick because of wearing, and so wrought thinner and thinner towards the edge round, untill it come to be as thin as a knife if it were possible; but because this Coulter is with many of high esteem, and of some advantage, and yet not much known, I wil give you the figure of it, as also of the best sort of English, for its compass, and a sharp thin well-tempered edge, that tends


Harfordshire Wheeld Plough
Pag: 199
The Duch Coulter
Pag: 194
Single Wheeld Plough
Pag: 203
Pag: 110 Plaine Plough
The Double Plough ploughing two Furrows at one time
The Pure Dutch Share
A hole for pt of y head
English Share



tends moſt to the eaſe of our Engliſh Coulter, and it ſhall be where I give the deſcription of the Ploughs I intend to ſhaddow forth.

And as the Plough-holder or Plough-man may much prejudice the eaſie going of the Plough, ſo one rightly qualified may in great meaſure advantage it, although the Plough be made never ſo exact and true; and therefore I give theſe two or three generall Rules to the Plough-holder, vvhich are naturall to any ſort of Ploughs whatever, although there are ſome different rules appertenant to ſome perticular Ploughs, as the double wheeled Plough, and the Turnwreſt *Kentiſh* Ploughs, which would be too tedious to diſcourſe, but theſe I leave to the Plough-mans practice, being eaſily found out by two or three dayes experience.

The firſt generall Rule ſhall be that the Plough-man be able to judge and determine within himſelf the truth both of the Plough-wright, and the Smiths workmanſhip, and in caſe he find an errour therein at firſt to mend it, which is far eaſier done than after the Plough or Irons be wrought into a greater error; yea then it is poſſible it may not be recoverable.

The beſt way for the tryall of a new plough.

And ſecondly, having his Plough, and all its Accutrements compleated, then to the tryall of it, and therein be ſure to make the firſt tryall of your Plough upon land workable, and regular lands, not upon lands above meaſure hard rooty, ruſhey, twitchey, or any way unfeacible, becauſe upon ſuch lands a true demonſtration of the goodneſs and truth of the Plough cannot be diſcovered, nor any Rule can be obſerved.

2 Becauſe ſuch lands will more eaſily and ſuddenly wrench, writh, or put a new Plough out of its work before it be wrought into its work. A rough new Plough being ſomewhat like an unbroken horſe, which may eaſily be ſpoyled in the hand of a violent mad-cap Rider, but if the horſe be kindly uſed, and taken off his untamedneſs by degrees, by eaſe, kindneſs, and patience, he is made a horſe for ever; ſo after that in ordinary land, your patient diſcreet Plough-man have well ſcoured your Plough, brought it to a true, fur-

furrow both for bredth and depth, and set your Irons as it will go it self with the very bearing of the hand to keep it steedy, then you may afterward be bold to put it to any service, or any lands whatsoever the strength of it will abide, and it may be serviceable for many years.

Thirdly let him be sure having once got his Plough into a perfect furrow, his plough avoyding all the earth as it takes it on at Breast, and carrying a fair clean furrow along with it, and turning its furrow cleaverly also from it, then let him not neglect a day, but Iron his plough with slipes or clouts in all the wearing places, smooth and even, and strengthen the neck of it with an Iron bolt, from the bottom of the head through the beam, and there strongly drawn up and cottered fast, if he have none before, that the Head may not draw the least, for after a plough is drawn in the Neck or Breast, it is probably wholly spoyled; and then alway be carefull in keeping your Irons sharp, and clean wrought, your Coulter edge thin ground, and Share phin as sharp as may be, and a very small point upon your share, all well steeled and tempered, your plough shall goe with great ease and truth.

Plough well clouted, and Irons sharp & smooth kept.

But lastly, the Plough-man must have a little regard to his Teem or Draught, and to the well geering or ordering them, if he will take all advantages he may or ought for ease, and therefore must alway make his Horse or Ox as suitable as may be, not some high and some low, but of an equality as even as may bee; much might bee spoken herein by way of reprehension and advice too, but I must forbear, onely advise that if your horses be unequall for height, then place the highest formost, and so your higher next, and your lowest last; many reasons may be given herefore; however make your Horses and Oxen as equall as you can possibly, if they be unsizeable, your highest draw up your lowest, and your lowest draw down the highest; therefore endeavouring all you can that all draw by a streight line is best, and preserves the full strength of your Teem or Draught for your plough, which otherwise you lose a very considerable part hereof, and let your Gears or Harness be strong and easie.

Size your Horses or Oxen equal.

Secondly,

Secondly, be as carefull as in ſizing them for their height, ſo alſo in matching them for their ſpirit as near as you can. A horſe of a dull, ſluggiſh ſpirit, and heavy, is fitteſt for ſluggiſh ſervice, ſuch as your heavy loads, or waighty draughts, fitter for carting than plowing; your quick lively ſpirited Horſes will be beſt for your Plough, and the dull horſes will be beſt to be placed together at what ſervice ſoever, and then they will not deceive their fellows, which many times is the ſpoyl of many a good horſe; your falſe deceitfull Horſe that will draw but at his own pleaſure, and fail you and his fellows at a ſtand or dead lift, as we ſay, is exceeding unſerviceable, and muſt be avoyded as much as is poſſible: Yet if he be quick ſpirited, and full of metall, he may doe beſt at plough and harrowing, and being ſized with his fellows is uſefulleſt in that ſervice of any other whatſoever.

Laſtly, he muſt be able to judge of his Land, and the ſeaſons of plowing, and to ſort his ſeverall ploughs to each alteration, otherwiſe he ſhall not be able to plow all his Lands, nor indeed any at ſome ſeaſons; and becauſe of this I ſhall ſay more hereafter, I ſhall diſmiſs my Plough-man with this exhortment, be as willing to learn as thou haſt need, and abandon thoſe poor ſilly ſhifts men make to preſerve themſelves ignorant and unſerviceable, As they have been Plough-men all their dayes, and are not now to learn, and men may as well be too preciſe, and better ploughs cannot be made than their Country affords, and could better have been deviſed they would long ſince: With hundreds more ſo childiſh, as are not worth an Anſwer; but theſe exceedingly ſtifle and choak Invention, and will do my Readers Imitation of theſe rude Diſcoveries.

A good character of a good Plough-man.

CHAP. XXIX.

The second Generall, whereby I shall descend to the description of the severall Ploughs in use, and shew you the defects in some, and the Advantages others have, and what Addition I can give both from my own Observations, or otherwise, to make up as compleat an easie Plough as my Experience will make out.

I Shall therefore confine my discourse to three or four sorts of ploughs.

First the Wheel-plough, I mean the double wheeled plough.

2 The single wheeled plough, and the foot plough.

3 The simple plain plough, without wheel or foot.

4 The Dutch Bastard, or plain Dutch plough.

Many other sorts there are, as some alter in their Heads, some in their Beams, some in their Stilts, &c. and most in their Shares, and all almost according to the Country of which they are, of all which it were too endless to discourse, but I onely name these, because I conceive all these usefull in some sort of Land or other, and a good husband had need be stored with two or three sorts of them at all times, especially he that hath severall sorts of Lands, of all which I shall say but little, yet a word of each; but I shall reserve the main of my discourse for those very particular branches of the plough that shall make out that ease I shall give thereto.

And first, as for the double wheeled plough, commonly called

called the Wheel-plough, and is of moſt conſtant uſe in *Hartfordſhire*, and many up-Counties; and is very uſeful upon all flinty, ſtony, or hard gravell, or any other hard Land whatſoever after it comes to be beyond its naturall temper, is an excellent good form, and a very uſeful plough, and very neceſſary that all great Corn-maſters have one of theſe for ſtrength, that ſo he may not force his other ploughs which are made on purpoſe for lands in a Tillable condition, and ſo are made more light and portable than theſe will bear to be, but theſe will go and work well with a great ſtrength, when other ploughs will not to any purpoſe; and becauſe much addition of eaſe cannot be given to this plough, which I ſhall not adviſe to but in the caſes aforeſayd, when and where other ploughs cannot work, theſe Lands being under an extreme. And as to ſuch extremes, nor none elſe will any ordinary Rule hold, that I may not work againſt the ſtream, leſt I ſwim alone; I will only give you a ſhort deſcription with the draught or figure thereof, and as any addition may be given to the plough in any of its members, it ſhall not be reſtrained from an application to this as well as to any other.

This is uſually drawn with Horſes or Oxen, geered double two a breaſt, and indeed ſo they draw the ſtrongeſt, but tread the Land the more, but why they may not be put ſingle in wet ſeaſons, or in dangerous times, I knovv not.

Plough-beam. This Wheel-plough is made of a ſhort ſtrong cleft Aſh-beam, about ſix foot long, and is contrary to all other Beams in the Compaſs of it, the crook or compaſs whereof looketh upwards, and the Land-handle thereof is placed at the great or neather end of the Beam, as other ploughs are, for it is uſually made with one handle, and the plough-ſtaff is inſtead of the Furrow-handle, and is very long anſwerable to the length of the handle, the lengthwhereof I much approve, and could wiſh it were obſerved in every plough whatſoever, it tending much to the eaſie and certain holding of the plough. Wheel-plows deſcribed.

The Sheath is made of the tougheſt, youngeſt Aſh, and perfect

Plough-sheath perfect dry that can begot, and set with a very good mortes very much forward, joynted exceeding true and close into the beam, and driven up so exceeding hard, with a bragget behind it to hold it from declining, that it stands and will to its work in the strongest land whatsoever.

Plough-head. The Head is pitched as strongly at the neather end of the Sheath and Stilt as can be, and pinned through both, and the Share is pitched upon the Head at a very deep pitch and somewhat hanging, that so the plough may go much a shore, because the holder usually goes two furrows off the plough wider on the neer side the plough: And as it is pitched deep, near a full yard pitch, so it is also very broad, being near half a yard, and that I conceive arises from the former Reason, because of the mans going so far wide of his plough. Their Shares are made exceeding narrow, and very strong, and runing out to a very exceeding long small poynt, very well steeled, and sometimes they adde a Tush or Phin, but they make it very narrow also, and so it must needs be, the hardness, and stoninesse of the land not admitting of it: And the Coulter stands a little above the Share-point, aud not before it, but rather behind it.

Plough-wheels As for the Wheels that bear it, being eighteen or twenty inches high, are made of about six spokes of wood or iron, fastned into a little short Hub or Nath, and a bark hoop or iron binding round about them: they run upon an iron Spindle about two foot long, which runs round in a Boulster which the iron spindle beareth, and it is three or four inches thick, and lieth betwixt the wheels about fifteen or sixteen inches in length or more, and at least eighteen or twenty inches in height, standing up to bear the plough-beam, & upon the same Boulster goes up an Iron pin eight or nine inchs above the Beam, and to gage it for its true depth; to the middle of which Boulster is fastened a short chain backward with a strong iron Coller, almost like a round Ring, which encompasseth the Beam, and is moveable, and to be put forward or backward, to make the plough goe deeper or shallower, as occasion is, and is held in its place with an Iron Hammer, the helve or shaft all of solid Iron,

and

and that is to be taken in or out of the Beam at pleaſure, to let it down or take it up as cauſe requires: and when the plough turns out of work at Lands end, it muſt have ſome cord or ſtrong whit-leather thong to come up from the Boulſter, to keep the Beam from ſlipping off being empty. And ſo you have a ſhort verball deſcription of the Wheel-plough as it is uſed in moſt parts of *England*.

This Wheel-plough requires a great ſtrength, and the greater becauſe of the great length they are made of, which carrieth ſuch a long and heavy weight of earth upon it, that it adds exceedingly to the burthen of it, which may be eaſily removed in ſome meaſure, by contracting the plough into a ſhorter, and ſomewhat narrower compaſs, and taking off as much of the weight and load both of Wood and Iron, as the ſtrength of the work will bear upon which is to be employed; yet it being a very uſefull plough upon ſome lands, and at ſome ſeaſons. The Figure expect with the other Ploughs.

The Turn-wreſt plough.

There is another double Wheeled-plough, and it is called the Turn-wreſt plough, which of all ploughs that ever I ſaw, ſurpaſſeth for weight, and clumſineſs: it is the moſt of uſe in *Kent*, *Picardy* and *Normandy*, and is called the *Kentiſh* plough with us.

The Beam may be made of any wood for the bigneſs of it, but Aſh is beſt: but the two handles are made of one forked peece of any wood, and the Beam tennanted into the Stilt below the Fork, and ſo it runs down into the plough-head, and is there tennanted and pinned into the head; and as for the Sheath, that is a good ſtrong peece of dry Aſh tennanted into the Beam, directly down-right, but looking forward at the neather end, and fixed into the Head ſomewhat as other ploughs are, but the Sheath far bigger downwards: the plough-head is pitched at a very great depth, or elſe at random for depth, being carried with two Wheeles as the former, but nothing like ſo neat nor eaſie; and for bredth, it is pitched juſt under the Beam upon a ſtreight line, and ſo it ought to be, as you ſhall ſee anon. As for any Shield or Breaſt-board, it hath none at all on either ſide the plough,

all other have, but a little peece of wood set along the Sheath forward, about five inches broad, closing upon the Share, just as if you would cut a Die in the midst from corner to corner, and place the flat side to the Sheath, and the edge forward, which is their breast-board. The Share is put upon the Plough-head with a pan half round upward, and flat downward, and is, or ought to be tushed a little on both sides, as our ordinary ploughs are, and so runs out to a sharp point.

They have one Wrest or two, some one and no more, but sometimes two, which I should conceive alwaies and at all times best; and this Wrest is to be put upon pins, one in the Sheath, standing just under the Breast-board, and the other unto a longer pin or round staff fixed into the bottom of the handle, as wide as the furrow, and this Wrest is no other but as a round stick about two foot long, or rather a half round one, with two holes in it to put the aforesaid pins into; and at every Lands end this Wrest must be turned on the other side; so if they have two must they both be altered also, and one placed two or three inches higher than the other, and the higheſt is to be placed broader by an inch and half, or two inches, and sometimes three inches than the lowermost to cast the furrow cleanly over.

And for the Coulter, that is also moveable in the Coulter hole, it being made very wide, at every Lands end, to which purpose they have a strong ground Oak-plant, about an inch and half over, that is very tough, and with that they will, having two pins placed upon the top of the Beam, one an equall distance from another, and both equally distant from the Coulter, wrest or writh the Coulter from one side to another, and there hold it till they come to the lands end, and there turn both Wrest and Coulter.

And thus you have a rude description of the Turnwrest or Kentish plough, and the Figure you should have, would it advantage my Reader half so much as it would cost the cutting; but they are so common in *Kent* all the Country over, and that so near *London*, that I had rather when thou hast a mind invite thee thither to see the thing it self, which

which will give thee better ſatisfaction than all the Figures can doe.

Yet thus much learn from hence, that the Land that lyeth ſo upon the ſide of a hill, as there is no plowing it upward and downward, may very well be plowed with this plough, and beſt of all, and it is eſpecially uſefull hereto; or if you have any flat levell peece, where you would not have one furrow diſcovered, this will do it alſo; the foremoſt Horſe or Ox alway going in the furrow, and the neareſt alway upon the Land, and alway double; and I am confident it may be caſt into a neater form, and made to very good advantage; the weightineſs and uglineſs of it I hate, but the Turnwreſt conceit I like, which my occaſions have not permitted me to experiment, of which I ſhall ſay no more at preſent, but that the Turnwreſts to caſt the furrow is very good and uſefull for the two ſorts of ground aboveſaid.

I ſhall now come to the one wheeled plough, and of that I ſhall give you alſo ſomewhat a large accompt, beauſe it is an excellent good one, and you may uſe it upon almoſt any ſort of Lands, which the Figure and deſcription of the ſame, which ſhall be drawn into that ſhape and form that will admit of more lightneſs and nimbleneſs than any of the former. The ſingle wheel plough.

You may ſee the uſe and faſhion of it too at Colonell *Blunts* near *Greenwitch* in *Kent*, a Gentleman of great eſteem and honour in his Country, who hath made very many of them.

The main Plough-beam is very ſhort, about five foot long, made of very good wood, but ſmall and light as may be, to which is another falſe Beam added below the Coulter hole, under the other and fixed to it by a ſtaple, drove up into the true Beam, with a capping upon the falſe Beam end, or ſome other way, the form whereof is not much materiall, which falſe Beam is that by which the plough is drawn, and gives opportunity by a Standard put into the end of it, bored full of holes, and paſſing through

the Maſter-beam, to let the plough up and down to any gage of depth or ſhallowneſs whatſoever, and indeed that Beam is the guide of it.

The Sheath is pitched very forward from the Beam into the mould of the Share whoſe Share-mould, as I may call it, is made as long as the Head ſhould have been, & is of the ſame uſe as the plough head is of, and is made of two ſmal ſlips, not ſo heavy as the Head would be, and there being no head at all, the Land-handle is put into the Share-mould with an Iron pin, and ſo is the Plough-ſheath alſo, and there fixed faſt with an Iron pin, and the Share forward made like another Share; and then juſt before the Breaſt-plate is a hole made through the Share, and there is rivetted, or elſe with an Iron hook put into a long iron ſlipe, which is made an inch, or inch and half broad, and ſo comes up to the Beam juſt before the noſe of the Shield-board, and ſo runs through it, and is cottered upon the top of the Beam lying upon the Shield-board, and the Shield-board is compaſſed a little hollow in the very Breaſt, and ſo from before the middle, begins to whelm and wind towards the furrow, and ſo windes more and more to the very end, and this Breaſt-board is placed cloſe upon the Share, which is made with a long point, and broad or narrow phin, as the Land requires; and ſometimes, and any time any ordinary *Plough* Share may bee uſed, and placed upon a Head as other ploughs are; either with a narrow point for gravell or ſtonineſs, or with a broader Phin, and long ſharp point, for mixed, ſandy, earthy Land, as well as that faſhioned Share, and be of the ſame uſe as I conceive.

The Pitch of theſe Ploughs are about, or above two foot in depth, and about eight or nine inches in wideneſs: This alway carefully obſerve, that the uprighter you pitch your plough to goe the narrower, and the more hanging, the broader. As for the depth, I conceive it is not much materiall, becauſe it is born up from the falſe Beam till it come to a true working pitch; and in the falſe Beam is planted an Iron Axeltree, about one Inch or a little more in bigneſs, and about one foot long, nine or ten inches be-

before the end of the falſe Beam, and put in ſquare into the Beam, that it may ſtick faſt; and at the other end of the Axeltree runs a wheel upon it, about eighteen or twenty Inches, or may be a little higher, or lower, as you pleaſe, which guides the plough from that falſe Beam, that it cannot ſling or draw into the ground, and ſo is drawn at the end of that falſe Beam, either with Horſe or Oxen, with Cock or Clevies, as you have occaſion or do deſire; but becauſe this plough cannot be fully diſcovered by the moſt familiar diſcourſe, but will require the Figure alſo, I will here give ye it, as near to the life as poſſible.

That which is the Standard, faſtned in the lower Beam, and runs through the over, to gage the plough, is made near two foot high, and in the over end is made two holes to put the Horſe-rane through, to come from the Horſe head to the very plough handles, to guide him to and fro, and under them divers removing holes, and one or two in the Beam equall to thoſe in the Standard, and an Iron pin put through them both. This plough neatly made, and very ſmall, hath been drawn with one horſe, and held by one man, and ploughed one Acre a day at ſowing time in a moyſt ſeaſon; and as Colonell *Blunt* hath related to me, he hath with ſix good horſes, ſix men, and ſix ploughs, plowed ſix Acres a day at ſowing time, in light well-wrought Land.

The Figure expect with his fellows.

CHAP.

CHAP. XXX.

Shall discover some generall faults that may be incident to all sorts of Ploughs, and give you the description of the Dutch *and* Norfolk *Ploughs.*

I Shall now proceed in this place, though not so Methodically as I should, to discover the usuall faults of many ploughs of all sorts, and most ploughs in *England* are tainted with some of them.

1 When they are made too big both of Wood and Iron, that is bigger than the work requires, they are the heavier to be drawn, carrie the more weight with them, and require the more strength to draw them. A husbandman must have his severall ploughs if he will carry on his work comfortably.

2 Fault may be in the roughness and ill compassedness of the Share, as aforesaid; and when a Plough is made too thick in the very breast; of this fault are many Ploughs in some parts, and though it help well in the sudden cast of the furrow, and will carry a great furrow with it, yet it goes very sore; of this fault are the ploughs in *Holland* in *Lincolnshire*, which otherwise have a gallant cast of the Shield board as I ever saw, which I have before at large described.

3 Is the shortness of the handles, by which a man cannot command his plough with that ease and truth as hee might do if his handle had length and compass: A short upright handle exceedingly dislike, a man having very little power to command the same, and when the plough is not truly held, it never goes easie.

4 The straitness of the Breast-board neither made nor drawn compass and croswinding for the cast of the furrow,

row, a very great fault to the Ploughs eaſe.

5 The placing the Wreſt even with the Breaſt-board, and as long as it, or near as long, nay I have in ſome parts ſeen it longer. It is as great a hindrance to the eaſie and true going of the Plough as any I know, and yet by very fevv diſcerned or reproved; I ſay, and had I time would give reaſons enough to clear it, that a good broad Wreſt, and five, ſix, or ſeven inches ſhorter than the Shield-board, is beſt, which being at the further end ſet even, or a little under the Breaſt-board, and at the neather end where it is pinned, either to land, handle, or otherwiſe it be ſet two inches narrower, and under the Shield-board, is both eaſie to the holder and to the cattle, and a main advantage to the turn and ſtrike of the furrow, and eſpecially the plough being made no broader behind than a juſt furrow breadth.

6 And laſtly the dulneſs of Irons, and either not clouting at all, or elſe uneven rough clouting and plating your ploughs, is a conſiderable hindrance both to the eaſe and laſting of the plough.

And theſe, or any of them, are all generals, and will hold, let them be upon what plough they will, or upon what Lands they will, or in what ſeaſons ſoever, and are great hindrances of the good of plough and plowing: And therefore what faſhioned ploughs ſoever you make, take heed of theſe Rocks, and for what ſeaſons ſoever you make them, avoyd them all, and then if thou wilt follow thine own Country faſhion doe, and God bleſs thee with it. I ſay not that theſe are all the faults, for there are many more, particularly treated of alſo aforegoing, but theſe are ſuch as may be prevented in any common ſort of ploughs whatever, and moſt of them in all ſorts, and will put ſuch an advantage to the ploughs eaſe, as with obſerving the foregoing directions alſo will be worth thy imitation.

In *Norfolk* and *Suffolk* are very good ploughs in many parts of the Country, and upon the ſandy parts, two horſes and one man will plow at ordinary ſeaſons, and almoſt any land of that ſandy nature, two Acres of a day, and many times one man with two horſes hath plowed three Acres of one day.

day: They seldom go with above two horses, and may with one horse, and one man; and if they plow any strong land, that they are forced to put in three or four, they set them double, and have but one man to plow and drive: Their ploughs are very small and light, and little compassed, all which are great advantages, but the greatest is the Land, which is a pure sand for the most part, and very easie working land; yet though this be the easiest, yet we have in many hundred places of this Nation very sandy light land, and very earthy mouldy land, a light mixed chissely land, and abundance of Errable Land in very good Tilth, where men usually go to plow with four horses, or four oxen & a horse, and seldom less, but many times more (which might as well, if not better be done with two) unless at seed time, novv and then two oxen and a horse, or three horses and two men, which is a wonderfull charge to the poor Husbandman, the extremity of which charge were it but removed, would be sufficient of it self to make him thrive and prosper. I shall conclude this discourse with a relation I had from a *Norfolk* Gentleman of very good worth and credit in that Country. Upon the Marsh-lands bordering upon the Sea-coast, a Gentleman set an hundred Acres to a man to plow, he covenanted with him to find him horse, and ploughs, and irons, and meat for the horses, and he was to find onely all mans labour, and he allowed him eight horses for the work, and for the mans labour that he was only to find to plow this land: the man covenanted to plow this Marsh-land, which is a mixed earth, and we have many thousand Acres as easie plowing in *England*, almost in all Countries for 5^{d}. an Acre, and performed it; he plowed his 8 Acres a day, he found but 3 men to the work, he went to plovv with two Teems, two horses and one man to one plough, and two horses and one man together in the morning, and one man to shift them at noon, and meat and gear them, and then he brought in two Teem in the afternoon, two horses in a Teem with the same men, and so plowed, as aforesaid, his eight Acres: I saw the ground thus plowed, and the poor man got his three shillings and four pence for his men and himself, that is ten pence

pence a day a man, which is good wages in *Norfolk*. It is a wonder that we ſhould be ſo ſlothfull, when ſome are ſo ingenious.

A Preſident of land plowed for 5 ſ. an Acre, plough and horſes found.

As for the Dutch plough, that I have alſo conſidered, which exceedingly differs from our ſeveral faſhioned Ploughs therefore I ſhall not give you the large deſcription thereof' becauſe as it is the pure Dutch plough, it is onely applyable to Fen and Marſh-land, where there is neither ſtone, nor root, nor hard place, and the chiefeſt advantage it hath to eaſe and expedition is in the breadth and ſharpneſs of the Share, which is made about a foot and a half broad, ſome more; and ſharp in the point, and as thin in the phin as a knife, and wrought moſt curious: a good Share being worth above twenty ſhillings, which caſts up a very great broad Furrow, very clean, and eaſie as is poſſible, out of which I have contracted as much there-from, in the deſcription of my Share as I can poſſibly allow to our uncertain changeable Land, to advance the eaſe which many times alters the temper and ſtrength twice or thrice in one land.

The dutch coulter is appliable to any pure clean land.

And then for the Coulter, that is alſo eſpecially applyable to the aforeſayd Land, but may be uſed upon any fair, pure, lay, turf, being old paſture. And thus I have given you the deſcription, and leave it to thy imitation; a good one wil coſt a mark or fifteen ſhillings; onely ſay you can hardly have a Smith in the Country to work well upon it, and far worſe upon the Share; but as to the baſtard Dutch, which is ſomewhat nearer appliable to our Lands, I have taken from it as much as it will afford me both in the caſt of the Shield-board, which is very good, as alſo in all the other parts of it, and do apply it to the plough hereafter deſcribed, and ſhall ingeniouſly acknowledge I have ſome branch from every of theſe roots, and from the *Norfolk* plough, and one wheeled plough alſo, from all which I find, that the ſhorter and leſſer any plough is made, having its true pitch, with its true caſt on the Shield-board, and ſhort Wreſt, and ſharp Irons, the far eaſier. Of all which, having ſo ſeriouſly conſidered, made, and tryed them almoſt every

The onely advantages for making the eaſieſt going plough.

one upon severall sorts of Land, and experimented them to the full with my own hands to my great expence, shall descend unto my third General Head for easing the plough.

CHAP. XXXI.

Thereby to demonstrate wherein the chief ease of the Plough consists, with the easiest going Plough, and the advantages gained thereby.

I Shall not with the least disparagement to any of them (giving them their due praise and honour) draw forth a description of the most easie-going Plough I can, and contract it to the least charge is possible; having all these helps and lights, and to adde nothing thereto were a shame to an ingenious man.

The description of the plain plow.

I will therefore take a short Beam, deeper one way than another, of a tough and dry young Ash, betwixt five foot, and six foot long, rising in the Coulter-hole, and strong there, but thence declining both wayes for strength, and so growing smaller, wrought round and smooth, my Sheath most exactly fitted into the Beam, and pitched pretty forward, and driven up so close with a little lace [or bragget] put behind the Sheath into the Beam and Sheath, just butting at both ends when the Sheath is driven up, which shall stand as a Buttress to support it, and may be as serviceable as an Iron dog as many use; my nearer Handle put upon a Tennant through the same, and drawn close with two or three wooden pins, and then both Sheath and Handle Tennanted exceeding close into the Head, being about two foot long, not standing upright nor level, but Beam-handle and Sheath hanging from a perpendicular poynt one fifth or sixth

ſixth part to the Land on the nearer hand; my Furrow-handle with two good round ſtaves planted on my Land-handle, as wide in the ends as a man can hold them, being very long and well compaſſed and fairly wrought; my Share formerly deſcribed pitched true upon my head, and drawn up with an Iron bolt through Head and Pan into my Beam, and cottered up, my Share ſtanding rather more hanging than the Head doth, ſo cloſe and true, as that water cannot peirce betwixt them, either with a Coumb weelded on, rightly compaſſed, layd into my Shield-board, placed as high as the earth works up, and as ſmooth as may be, to the end my Breaſt not being too thick at the noſe, nor widening too ſuddenly, and as ſoon as the earth comes to the middle my Shield-board to widen, whelm, or compaſs, as if it would lie upon the Furtow, and ſo to widen and whelm more and more unto the very end; or elſe a Shiner planted upon my Share, moſt cloſe wrought, compaſſed and nayled to the Shield-board in the form before preſcribed.

My Wreſt a large hand-breadth, planted under my Shield-board bottom, and narrower than it, and rather yet narrower to the Shield-board end, ſo that it retain the juſt and full bredth of my furrow, and no broader, it both goes eaſier, and helps the caſt of the forrow: I deſire it be well plated too, but ſhorter by five or ſix inches than my Shield-board, and by two inches than my Plough-head; my whole Plough boarded up ſo cloſe as no earth may get into it, and plated very well and ſmooth in every wearing place whatſoever: As for the pitch both in breadth and depth, that muſt be reſolved both from the height you make your Plough, if high in the cheſt, your pitch muſt be the deeper, about eleven or twelve inches, or about ten or eleven and a half; if to go ſingle you muſt pitch it broader, if to go double narrower: Every common Ploughwright can help you here, and alſo underſtand what here is directed; my Irons kept both hard and ſharp in points and Phin, and this Plough being once well ſcoured and clean, if it goe not with as much eaſe as nature doth admit, or Art hath hitherto diſcovered, I will acknowledge my miſtake; but what ſtrength may

The benefit of a broad and ſhort Wreſt.

draw it I shall not determine, I have told you what hath and doth draw the other ploughs before described, and could you shew me all the Lands, and all the temperatures at all seasons of those Lands, I could easily demonstrate that, but to me it is sufficient if that I have both rationally and experimently discovered to thee the best Plough and easiest that I know or have read of in the world, as I have cordially done, and given thee the product of my experience, and from each removed the inconvenience, and drawn out the quintessence as I am able. If this Plough be preserved from any earth cleaving at all to it, bee as little in compass as any, have the advantages of sharp Irons, and perfect true Workmanship, as that it need no Wheel which is a weight, and requires strength, and is of no use but to guide the Pitch, and this Pitch be made so true of it self as it will goe without it, and the Wrest cut shorter, which gives much ease, and makes the plough go more certain, and the furrow turn better, and all these are as an addition to it; I conceive and know less strength will draw it; to which if you please you may adde the Dutch Coulter, it going somewhat easier, and is best for the pure turf without stones, but the other being kept as sharp is more certain, and not subject to be cast out of the ground, and will do exceeding well in wrought tillable land, if you keep it a little before the share, that it may cut first, and one thought wider also, but never within the Share: 'Tis true in irregular extreme land either for stones, roots, or hardness, I am at a loss, and for that end advise to the double-wheeled plough, which though it will be no otherwise advantaged to ease than as it is well and compleatly made, yet it is for strength, and to supply extremities and cases of necessity without rule.

But thus much I will say, that take or make me such a plough, aforesaid described, upon any of the aforesaid lands, where the easiest and best ploughs are used (which I could wish had been before now discovered, which would have saved me this labour) and make tryall of it, and as the land is lighter and easier, so make the plough lighter and lesser, and if it go not easier by a considerable part, my judgement fails

fails me; I am ſure theſe particulars conſidered, and ſolidly put in practice throughout this Nation, may very well ſave one third part of the charge and toyl of Horſe and Man; nay in ſome parts I am confident near one half, and if to the beſt plough it will give but the leaſt addition, it is ſatisfaction enough to me; but I very well know, it will ſave one horſe in four, and I beleeve one in three, as moſt Countries uſe, and one man in two. All that I have ſayd is but to the pitch, and making the body of the plough. I ſay again, if any contend for wheel or foot, he need but give his plough a little deeper pitch, and he may adde either thereunto, as wel as to any other, and pleaſe himſelf. The deſcription of it ſhall follow in the end of the 33 Chapter.

What eaſe and advantage this plough and the directions will afford.

And if you object, what ſhall guide the plough for depth, and keep it from ſtinging in clay ground, and how may you let it up and down as the nature of your land requires?

To which I anſwer, that having both in your plough, and plough-Irons brought your plough to a true and perfect pitch, it will require but little help herein, yet hereby you may much anſwer your deſire in two particulars.

1 In your hindmoſt gears you may at your chain that is put upon your plough-cock, or clevies, which ought to be made ſhort linked on purpoſe to take up or let down as you ſee occaſion.

2 Your hindmoſt, or Fill-horſe at the back-band, which may be to take up or let down, you may eaſe your ſelf at pleaſure; and ſo I deſcend to the laſt Generall head.

CHAP. XXXII.

Containes the Applicatorie part of Ploughs use, wherein I shall endeavour to hold forth to what sort of Land, and to what seasons or Tilths of Land each Plough is, or may be most serviceable.

IN the description whereof I shall in generall say, that when lands come to that extremity of hardness as the Plough is forced beyond its gage or pitch of Truth, and that nothing but force will overcome it, then we must be content to lay by our hopes of ease, and all our ploughs whatsoever that were made upon that account; for it is concluded that all good Husbands will take their seasons, which seasons are chiefly for all their Summers crops, in Winter when the Land is moyst and workable, from *November* untill *March*, and for all Winter crops the foundation of that work is too to be layd in Winter, as in the end of *December* and *January*, to fallow as wee call it, all our strong coarse lay Turf, when wee may work it well, and clear it up to the bottom, which being once wel ploughed in a right season, it will work reasonable well in the hardest season the next ploughing, and so very well the next, and so throughout, when it is compleatly plowed at the first; which first opportunity if it be over-passed by too much business or sloth, or otherwise makes all the rest of our Tilthes uncomfortable; every common Husbandman knows these things.

The season of plowing for summer corn.

The season for plowing for winter corn.

And for this Tilth, or season of plowing, and these sorts of Lands especially being very rough, hilly, or banky, your Wheeled-ploughs will not work, but will be cast out by e-

very

every hill: for this uſe I ſhall adviſe you to the plain plough made a little ſtronger than ordinary, with a true pitch both for breadth and depth, and becauſe both wheel and foot too will caſt it out at every hill, and ſome men cannot hold a plough without either; and poſſibly thy land may be uncertain Land, that is, ſome clay, and ſome ſand, and ſome mould, each of which will alter the going of the plough, therefore in this caſe let an Iron foot be made, with a ſharp edge like a Coulter forward to the bottom of the ſhank, and the foot made flattiſh, and very thin at both edges, and a little ſtronger in the middle, riſing like a Pleace fiſh, and no thicker, and that will cut your Hils before your Coulter, and keep it out of the ground too from ſtinging or drawing into the clayes; but yet a good Plough-holder with a good Plough, will caſt this away alſo in the rougheſt lands, and meerly with his hinder chain, and backband of his hindmoſt horſe take it up at pleaſure, and even play with it too in the ſtrongeſt workable work, when another ſhall moyl himſelf like a Beaſt, as we ſay.

A foot deſcribed as will goe in hilly ground.

But to haſten, when by a drought you are out of work, then I ſay as afore, that with ſtrength your wheeled-plough will doe exceeding well, and none like it, your double wheeled one I mean, and your ſingle wheeled ploughs too being exceeding ſtrongly made, will tear up any reaſonable ground, but in regard the wheel goes but upon on Axeltree, and that is fixed but in one end, in the falſe Beam end alſo, it cannot be ſo ſtrong as the other by far, therefore I adviſe every good Husband to one of theſe, the body of whoſe plough may be made to the ſame advantages heretofore preſcribed.

As for the caſting down a land, or plowing any flat land, almoſt any plough will do well, and ſo your broad-breaſted ploughs will turn over a great furrow, though your Shield-board have little compaſs; but as to the ſetting up a Land, or ridging it, as moſt call it. I would have a narrow breſted plough, with an exceeding wheelming compaſſed Shield-board, increaſing both in the breaſt by ſmall degrees, and in the compaſs of the Shield-board with a very broad

A plow to caſt down land.

A plow to ſet up land.

and

and ſhort Wreſt, which addes one or two degrees of caſt or compaſs to the Shield-board ; for in this work you will moſt apparently ſee the eaſe and advantage thereof.

The particular uſe of many of the members of he wel regulated plough.

The Coulter having firſt done his office by going before, and dividing out the ſurrow.

The Share his, in cutting it up clear, and raiſing it from the ſolid Land.

The breaſt of the Shield-board takes it and gives it a caſt and turn, that it is ready to fall.

The Wreſt keeps it ſurrows breadth (for the horſes eaſie going) and not ſuffer the furrow to drop ſhort of its true place, but leaſt it ſhould ſtand an edge

The Heel, or hinder end of the Shield-board comes, being longer than the Wreſt, and ſtanding as it were overlooking to ſee what it will leave, and like a Ladies trayl, gives the Furrow a ſweep, or a good check, and bids it lye there in its proper place, and not ſtand upon the edge.

And thus each member having done his office, one taking it from another regularly muſt needs admit of the greateſt eaſe. A Saddle-tree is made of many peeces, and ſome compaſs one way, and ſome another, but all to the true compaſs and eaſineſ of the horſe-back, ſo a plough, it might be made of fewer parts and leſſer compaſs, but that fewer will not give he true compaſs or caſt of it, and deliver his furrow upon the beſt advantage.

How to plow as it may yeeld moſt mould.

As for your ordinary ſeaſons of plowing, your Land being in good Tillage, any well ordered, and truly compaſſed plough will do, you may help your ſelf ſufficiently in the making of your Irons, if you would have the edge of your lying furrow lye up higher, which will yeeld moſt mould, then ſet your Share-phin the ſhallower, and ſet your plough the broader, and hold it the more aſhore, the Plough-man going upon the Land, and it will lay it with a ſharp edge, which is a gallant poſture for almoſt any Land, eſpecially for the lay Turf beyond compare.

How to plow as you lay your land moſt level.

But if you would have your land lie moſt even and flat, then ſet the Phin of your Share deeper, or holding, as ſome call it, and ſet your plough the narrower, and the holder alway

alway going in the furrow, and the Shield-board end will ſo humble it, as you may lay it upon a levell; this is beſt for land of which you will make a fallow, or cut and burn the Turf, or for land you intend to lay flat to graſe. If the furrow ſhould be all at once turned at the very breſt, then i would go juſt as if you would put a Mould to rout with her breech forward; which plough I have ſeen, but how the furrowwould lie I know not, nor well what ſtrength to dravv it; but then there need neither be uſe of the hinder part of the Shield-board, nor Wreſt neither; or if you would have it caſt all in the Shield-board, as ſome do that make no Wreſt at all, then it will either not clear up the furrow well, ſet the furrow upon an edge, or elſe the hinder end of the Shield-board muſt whelm beyond all preſident or rule; or it you would have it made ſo thin in the breaſt as to cut through like a knife, and turn nothing till it come to the midſt of the Shield-board and end of the Wreſt and Shield-board, then there it gives too ſudden a check too, and cauſeth the earth to choak and mouther upon the Breaſt-board, that it will not ſlip away with eaſe; ſo that as I ſaid before, a medium in all, each member doing its particular office, preſerves the health and comfort of the body.

Theſe thiugs (and many more which might be neceſſary, I will forbear to ſpeak to) are accounted niceties among many, the knowledge whereof hath coſt me much, and therefore am able to affirm that the very myſtery of Ploughmanſhip lyeth upon the knowledge and practice of them, and ſo I proceed to the double plough, and the deſcription thereof.

CHAP. XXXIII.

Holds forth a description of a double Plough carrying two Furrows at once, and both proportionable to a Furrow one ordinary Plough shall carry: With a Plough that shall both Plow and Harrow both at the same time; and how to make a Plough last a dozen years.

THe double Plough shall be as plain as may be, it shall consist of one long Beam of an ordinaty length, and another short one, little above half the length of the other. The first plough may be made up compleat in all the members thereof according to the last preceding description of the plain plough, except the handles which may be very short, only so long as may receive the Beam with the Land-handle, and place the Shield-board on the furrow side, which may be done without any but a round staff from the Beam to the Shield-board; which handles excepted, it is one compleat plough in all particulars. The hinder end of the Beam is to be left a little stronger, because of fastning the other Beam firmly thereunto, and then I proceed to the making of the hindermost plough, which must be made in all the members and branches like the other, except the Beam cut off about three inches before the Coulter-hole, and the handles of this at length and strength as an ordinary strong plough is made, just according to the pattern of the plain plough.

Which being done, and the handles upon the last plough, you must set to the placing of it in his place, which I discover thus, the first plough standing in its working posture, the other plough with the handles to it is to be affixed on the nearer

nearer ſide, or left-hand, one furrow breadth wider than the other, juſt in the very ſame poſture both for depth and breadth as the other doth, and ſo held off from the firſt ploughs beam by a lining, or filling of wood juſt that ſubſtance as may continue it firm and faſt to a juſt furrow, and there drawn cloſe and firm to that Maſter-beam with two ſmall Iron bonds, and a broad ſloat or two of wood, all which may be ſo keyed and cramped up, that it may be as one ſolid Beam, and ſo move as the firſt moves, either for height or depth, which it muſt needs do, and this I conceive may be beſt uſed with a plough-foot to guide the depth of it, unleſs you place a wheel to that foremoſt Beam, but not in a falſe Beam, becauſe I have not experience of applying this doubleneſs to thoſe deep pitched ploughs, but in the end of that beam you may have as good a mortes as your beam will bear, which is the mortes for the foot, and therein you may place a ſquare good ſtrong peece of tough Aſh, or rather of Iron, into which you may have your Iron Axel-tree with its ſquare end fitted into three or four ſeverall holes of it, by which means you may ſet your plough at a working gage, and there continue it, and alter it as you ſee cauſe; which plough thus marſhalled, you may well plovv upon ordinary errable land that is in good tillage a double proportion, and alſo upon fair clean lay Turf, and this you may manage with two men, and four good horſes, but not either upon ſtony land, or rough land, the deſcription and diſcourſe wherof I give not in as of any great advantage above the other plain plough, but for variety ſake, and to provoke others to the amendment and perfecting of this diſcovery; yet I for preſent ſee not, but it may be of excellent uſe and expedition upon many lands in *England*; and to ſay much more is needleſs, in regard of what hath been before ſpoken, and experience of a good Ploughman will order it at pleaſure.

How to ſet the double plough together.

And ſo I ſhall onely diſcover one other plough that will both plow and harrow of it ſelf at one and the ſame time, and it is uſed in ſeverall places in *Norfolk*, yet caſting about with my ſelf the advantages and diſadvantages alſo,

The Plough with a harrow affixed

and finding not how it will so well suite with our common wayes of Husbandry as to be a generall advantage, shall say the less, only tell you the manner of it, It is a common light Plough, as all theirs are, and as little and light a Harrow, which may contain three little Buls, and about five Tines in a Bull, which is made light also, and fixed to the plough at the one end of the Beam, so that as the plough turns this turns also, and as the plough turns one furrow, the harrow harrows it over, reaching two more furrows, and so by the over-reaching it strikes two or three times in one place, which is sufficient for the covering any corn whatsoever shall be sowen upon *Norfolk* lands; but finding these two prejudices against it, *viz.* either this land must be sowed as the land is plowed, & so it will take up a mans time sowing an Acre, when otherwise a man will sow nine or ten Acres of one day, or else it must be sowed before plowing, and then it must be plowed in, and harrowed upon the top of it, which fals not under my experience, having known much land fall far the heavier, and more subject to binde and bury, than if onely lightly covered with the plough, and layd more open; and now thou hast the story, that such a thing is, and may be done, may thy own experience be the determiner of the matter: but after the writing hereof having communicated thus much to a Gentleman of art and worth, do find that another addition may be made thereto, which is how to drop the corn, corn by corn proportionably to that quantity I desire to sow upon an Acre, which if by his assistance I can experimentally make out, I fear not to give you plough, and harrow, and seedsman all at once, and all to work with two horses and one man upon some lands, and with three horses upon all of this nature, and all to be done almost within the same compass of time that you are upon the plowing of it, it shall not require one hour in the day more; which if I shall accomplish, you shall save near three parts of your seed also, and a considerable peece of labour too, and not fail to have a better crop through the blessing of him that waters all, than ordinary wise. All which I hope to have brought into substantiall experience upon my own lands

Plough, harrow, seedsman, and all in one plough to work all at one time.

lands by the next edition, and then expect the faithfull communication thereof. One word more which would have come in more ſeaſonable about the deſcription of the plain plough, and that is how to make a plough that may laſt many years, ten, or twelve, or fifteen years, yea I heard a workman affirm he would make one ſhould laſt 20 years: As for the manner of the plough, it is ſufficiently ſpoken to already, all lyeth in two things, one thing is the wood it is to be made of, and the other is the workmauſhip of it.

The wood, eſpecially of the Sheath and Plough-head, which is the materiall fundamentall peeces in the Plough, muſt be made of heart of Oak, which to me at firſt ſeemed ſtrange, but upon a ful debate of the matter I find that if it be young tough Oak, and wrought ſo exact true in the joints as may be, and kept ſo cloſe boarded up as that water cannot get into any of them, and layd alway dry, and ſo kept, but while in working, and every part of it well clouted and plated with Iron, and drawn cloſe in the throat from a hole in the Share, through the Head & part of the Breaſt-board with a through Iron pin which is to be wrought ſomewhat bigger under the head, that ſo it may ſomewhat ſtrain the ſhare to a more perfect cloſure, and ſtronger ſticking to the Head, & wel cottered up through the Beam, being bored with a long ſhanked Auger through all: And all the reſt of the wood to be young white tough Aſh, and wrought compleat and true in every joint, & layd up when out of uſe, both out of wind and weather, & out of queſtion a good plough may well ſerve a mans uncertain life: and ſo having as I hope, in ſome good meaſure ſupplyed that deficiency in Husbandry Mr. *Hartlibs* Legacy chargeth us withall in the fifth page of his Book, and ſo proceed to the next peece of Improvement.

The laſting Plough that may endure many yeares.

The Third Peece of Improvement treats of Welde, Woade, and Madder, three rich commodities for the Dyars.

CHAP. XXXIIII.

Onely holds forth Welde, or Would, as some call it, or more properly Dyars-weed.

Welde described.

IT being a rich Dyars commodity, beareth a long, narrow, greenish, yellow leaf, & bringeth forth a yellow flower, which runs to a small seed far smaller than a Mustard seed, very thick set with seed; *Pliny* call it *Lutea*, but *Virgil* calls it *Lutum*, and in our English Welde or Dyars-weed. It flourisheth in *June* and *July*; it in many places groweth of it self, in, and about villages and towns, and is of a very great use, and considering the easie charge of the raising of it, and the badness of the land upon which it will grow, is of incomparable advantage.

For first it will grow of very indifferent land, not worth above ten groats, or half a Crown *per* Acre; yea as some affirm, the veryest hilly, barren, chalky, light land, not worth twelve pence *per* Acre will carry it, and bear it to very good purpose, but unto so barren lands I shall not give incouragement, unless where there is little or none better; but as any indifferent land, so it be of a very dry, warm nature, it will do very well.

The manner of sowing it at no cost.

And secondly, it will cost but a little the managing, it requires no tillage at all, no harrowing, it being to bee sowed

sowed when and where you sow your Barley or Oats upon that Husbandry without any other addition, unless you draw a bush over it, or a role, either of which is sufficient to cover it after you have sowed it, the difficultest peece in the managing hereof is the very sowing of it, that is, that it may be sowed even; for the seed being so very small, will require both skill and an even hand to scatter it; some sow it by taking it with one finger and the thumb, others with the two fore-fingers and the thumb, but neither of these do I affect the best way, because they cannot spread it so well as they may with their whole hand, I therefore prescribe a mixture with Ashes, Lime, fine earth or some such thing as will best suit with the weight of the seed; for could you find out that, that agreed both in weight and bigness, then out of all question none to that to sow it withall.

A gallon of this seed will sow an Acre, which had need to every quart of seed have two gallons of some of the afore-said, and it must be often stirred together lest that the seed sink to the bottom, and so that part sow thicker than the other, and then cast it out at arms end at as good and even compass as you can possibly. How much soweth an acre.

This seed thus sowed may grow up among the Corn, and yet be no prejudice, because it groweth not fast the first Summer; but after the Corn is cut it must be preserved.

And the next Summer you shall receive through Gods blessing a comfortable crop; you must be exceedingly curious of the ripening of it, if you let it grow too long, your seed will fall out, if not long enough, your seed will not be perfect, nor your stalk neither; and therefore observe both the turning of the seed, and the ripening of the stalk; for I cannot tel you which of either will admit of a dispensation, and as soon as ever you perceive it near up to perfect ripeness, you must down with it, that is, pull it as you doe Flax up by the roots, and bind it in little handfuls, and set it up to dry in little stilches or stitches, untill both seed and stalk be both dry, and then carried away carefully as that the seed be not lost, and layd up dry, and so kept as you see cause for a good market; When ripe.

How to use it.

market; for it is to be sold for the Dyars use, who sometimes will give a very good price, but at all times sufficient profit, and go far to buy it, from forty shillings an Acre, to ten or twelve pound an Acre, some say more. And you may barn it up, and keep it and the seed together until *March*, and then you may get out this seed by lashing or whipping of it forth upon a board or door, which reserve for seed; the seed is of good value, sometimes worth twenty shillings a bushell, and sometime ten shillings a bushell, and sometimes more or less as markets rise and fall.

It colourеth the bright yellow and the Lemon colour; The stalk and root are both usefull, and must go together to the Dyar.

What Improvement welde yeeldeth

And if this Weed prosper well, as questionless it will after you be got into good seed, this will make good my promise, if it prove worth but fourty shillings *per* Acre, the land being not worth above five shillings, or six shillings & eight pence, as either of these will do exceeding well; the charges of sowing, and all things till you come to pulling it, is not above one shilling *per* Acre; the pulling, whiping, and barning may come to four shillings more; the seed may be worth half a crown, so that all charges and rent of the land may amount unto less, but I will say fifteen shillings, then the Improvement will be fourfold, if worth four pound ten shillings an Acre, sixfold, if worth six pound *per* Acre, eight fold, and much more, as some affirm to sixteenfold Improvement.

This Land though it lie far from Towns, Cities, yea in in your remotest Countries may be brought to this height of Improvement, and it begins much to spread and thrives very well in *Kent* in many parts of it; the best place for to get the seed is in *Kent* clean down to *Canterbury* and *Wy*, where you may see both the land, the growth and discover the mystery thereof. It is sold by weight so much a hundred, and so much a tun weight. It is my desire to make publique whatever comes under my experience, yet this hath been used this many years by many private Gentlemen in divers parts, but not discovered for publique practice, but no marvell, for that

that great buſineſs of planting Hops, that is one of the famous peeces of our Nation, hath not any thing been wrote near this fourſcore years that I can read of, and indeed then was wrote a large diſcourſe thereof, but I remember not his name, or elſe I ſhould have here raiſed up his memorial, having done exceeding well thereon, but that all this time of ſo large experience, none ſhould get upon his ſhoulders, and a little adde to his beginnings, is the unthankfulneſs and ſhame of your great Hop-maſters. I fear mens ſpirits are ſtrangely private, that have made excellent experiments, and yet will not communicate; ſurely me-thinks plenty and publique fulneſs ſhould not be ſo much feared as rejoiced in. And ſo I hope in this I have in ſome meaſure ſupplyed my promiſe.

CHAP. XXXV.

Treats of Woad, the Land beſt for it, the uſage of it, and advantages thereby.

WOad it is alſo a great commodity, it layes the foundation for the ſolidity of very many colours more: A Woad-red colour is free from ſtayning, and excellent for holding its colour; almoſt any ſad holding colour muſt be Woaded. It hath been one of the greateſt Inrichments to the maſters thereof, untill the midſt of our late Wars, of any fruit the land did bear. It is called *Glaſtum* or Garden-woad, by the Italians called *Guado*, in Spaniſh and in French *Paſtell*, in Dutch *Wert*, and in Engliſh Woad or Wade. It hath flat long leaves like *Beben rubrum*, the ſtalk is ſmall and tender, the leaves are of a blewiſh green colour. The ſeed is likeſt to an Aſh-key or ſeed, but not ſo long, like little blackiſh tounges. The root is white and ſimple. It is a very choyce ſeed to grow and thrive well; it beareth a yellow flower,

and requires very rich land, and very sound and warm, so that very warm earth, either a little gravellish or sandish will doe exceeding well, but the purer warmer solid earth is best: Land exceeding rich, and though it should be mixed with a little clay will doe well, but it must be very warm. There is not much land fit for this design in many Countries, especially your hardest Wood-land parts, you have in many of your great, deep, rich pastures, many hils and hill sides good Woad-ground, when the bottom ground will doe no service, but your chiefest is your home-closes, or lesser ground lying near and bordering about the towns.

The best land for Woad.

Your best and naturallest parts of *England* for Woad, are some part of *Worcestershire*, and *Warwickshire* Southward, *Oxfordshire*, *Glocestershire*, *Northamptonshire*, *Leicestershire*, some part of *Rutland*, *Bedfordshire*, and *Buckinghamshire*, and some other places here and there, all these parts have some admirable Woad-land in them.

Best known parts for Woad

But when it is a quick commodity, as now it is dull, they will find as much more land as now they will, and then more indifferent, dry, sound, warm land will serve, but very dry and sound it must be, and worth about twenty shillings an Acre to grase at least, or else it will not bee worth the Woading.

What price men will give for good Woad-land.

And to plow to sow Woad it may be worth as much more as to grase, yea somewhat more if it be extraordinary rich soyl, and trading good, but now as the seasons are, and trading stands, they will now make great orts of land, and not bid any money for that which in good trading times they would have gone fifty miles to have took at great rates.

And whereas some write that it undoeth the land, I answer as I judge in my own breast, that in regard it is so often cut, and groweth so thick, and is so often weeding, that it must needs do so, as I beleeve all Corn doth draw forth some of the spirit thereof, but no more than other Grain would if it could be so oft cut up to grow again.

But it is the confidence of many Woade-men that will maintain against any man that it betters the land and mends it,

it, but to that I cannot accord neither, but thus much I do say, it prepares the Land exceedingly for corn, and doth abate of the strength and superrichness, or rankness thereof, which corn would not well endure, for I maintain still that the richest Land is not best to corn, for though the one may overburthen and be so rank, yet the other may bear as much to the strike, and for goodness your middle Land beareth the bell away for corn in my opinion.

Woad prepares exceeding well for Corn.

The best Corn.

Very much may be spoke to this particular, but I must shorten and will as much as may be, and acquaint you with the use thereof. And herein I must do these three or four things.

1. Shew you how the Land must be prepared and sowed.

2. Shew you how it must be ordered, when the leaf must be cut, and how ordered after cutting.

3. And lastly, how it must be tempered and seasoned to make the best Woad for use and profit; but before I proceed I must inform my Reader that this commodity can not be played withall, as you may do with Liquorish, and Safforn, &c. to make experiments of a little parcell, but a man must of necessity set forth, and forward so much stock and Land, and seed, as may keep one Mill or two at work to make it into perfect Woade; It is the doing of a great quantity, and carrying on a great stock that makes this work, and will carry it on to profit and credit: Some have as much under hand, and will work six or eight Mills. The charge of it is exceeding great in the mannagement of it, and as well it payeth for all charges as any commodity I know of, that is of old experience.

The ground must be old Land as aforesaid, and a tender Turf, and must be exceeding choicely plowed, if very hilly they must be cast, and well cast, that that you cast forth lie not high to raise the furrow, they usually Plow outward or cast all their Lands at the first Plowing, and having broke the ground with a Harrow, then

How ploughed.

How much sowth an Acre.

they sow it, and sow about four bushells or strikes of an Acre, which done, then cover it, and harrow it very well and fine, and pick off all the Clots, turves and stones, and lay in the hollow places of the ridge on heapes as is the usuall custom, but now I should rather (if there be no other reason than I conceive) chuse to take a little Cart with one horse, and as the boys or children pick them up, cast them into the Cart, and carry them into some flank or hollow place, and lay them down to rot, or else mend some barren place, because they lose a good considerable part of Land, and so of Oad too, which otherwise might be as good as the rest, and is now worth nothing; the Land that is lost is very considerable in regard it is so good of it self, and the stock so good and rich that is sowed upon it, that all even ground had need be regained that possibly may be. And so I descend to the second particular.

2. Which is to shew how it is to be husbandried, and when the leaf must be cut, and how used, and how oft, &c.

What it costs an Acre weeding.

After the Land is sowed and it begins to come up, as soon as any weed appeares it must be weeded, yea may be twice weeded or more if it require before it be ready to cut, but if it be speciall good, and come thick and cover the ground well, it will ask the less weeding; to them that are exercised in this service, and have their work and work olkes at command, they will have it weeded for eight pence an Acre, and somtime less: As soon as the leaf is come to its full growth, which will be somtime sooner, sometime later, as the year is dryer or moister, more fruitfull or less, which when you you perceive at the full ripeness set to cuting of it.

As soon as ever it is cut, your Mills being prepared, and great broad fleakes so many as may receive one Crop prepared, and planted upon galleries or stories made with poles, Fir, Alder, or other wood whatsoever; your Mill is usually known, a large Wheel both in height, and bredth, and weight doth the best, it is a double wheel, & the

Tooth

Tooth or ribs that cut the Woad, are placed from one ſide of the Wheel to the other very thick, wrought ſharp and keen at the Edge, and as ſoon as the Woad is cut and comes out of the field, it is to be put into the Mill, and ground one kilnefull after another as faſt as may be; the joice of the leaf muſt be preſerved in it and not loſt by any meanes, and when it is ground it is to be made in balls round, about the bigneſs of a ball without any compoſition at all, and then preſently laid one by one upon the fleakes to dry, and as ſoon as dryed, which will be ſooner or later as the ſeaſon is, they are to be taken down, and laid together, and more put in their places, but becauſe all Circumſtances will be too tedious to diſcourſe, & the work is a common work and very many wel verſed therein, I will rather adviſe my Reader to get a workman from the Woad-works which can carry it on artificially, than venture the experimenting of ſo great a work upon words and rules, and therefore I ſhall be very brief, and let you know that good Woad may yield in a very good year five or poſſibly ſix crops, yea ordinarily four and yet ſometimes but three, but the Winter crop is of good worth, excellent for ſheep, conceived good againſt the rot, or will recover a rotten ſheep, and alſo it will maintain them well, and though at firſt they will not much affect it, yet with a little patience in holding them thereto, they will take to it moſt perfectly, and that with love, and it will continue them in good heart, and ſtrength, till ſowing time again. The time of ſowing is in the middle and end of *March*.

The joice of the Woade muſt be carefully preſerved.

Five or ſix Cropps in one year of Woad.

Seaſon for ſowing Woade.

And thus when you have cut all your cropps one after another till the Autum or declining ſeaſon will not ripen it again, and your mill is at leiſure, then you muſt proceed to the third particular.

Which is to the ordering and ſeaſoning of it, and working it up to uſe, which muſt be done the manner following, you muſt ſet your mills to work again, to grind it all over again, and then ſeaſon it up, and ſo you may make it ſtronger and weaker as you ſee occaſion.

There is so much difference betwixt Woad and Woad, that the Buyers though so experimentall will hardly buy you any parcell untill they have experimented it in Colouring: And therefore for me to prescribe a Rule upon such uncertainties I hold it not safe. The Woad-man will make you up three or four sorts of Woad, according as he intends to friend a Customer: And therefore I shall advise thee rather to get an ingenious workman at the seasoning of it, who with that judgement he hath, and the experiences, he is now in capacity to make, he may season it to all occasions and interests whatsoever, and so I come to the Advantages thereof which are very great.

The advantage of Woad.

And first it is nationall, in that it sets many poor on work, is the staple and chief of the Dyers Trade, layeth a foundation for all holding colours, and much advanceth land in the Rent, it doubles or more, and in the usage of it upon this husbandry trebleth or quadrupleth it, and many times more: and then secondly it is personally advantagious, the best Estates that have been got in all our rich upland Countries have been got by it; at some seasons, and when they have aright Crop and good markets, it will amount unto as much more: it hath been sold from twenty pound the best Woad to thirty pound, and back again from thirty pound and twenty six pound down to six pound a Tun.

CHAP. XXXVI.

Which discovers the nature, use, and advantage of Madder.

AND so I shall descend to my third Dyers commodity in relation to Dying or Colouring, and that is to the story of Madder: that colours the rich and best solid Red, the which if I can so mannage as to bring it unto the same progress as Oade is brought unto in *England*, I mean that

Begin to read this leaf after Cuſtomer, in the ſeventh line of the 230 pag.

A word or two more, as to the ſeaſoning of Woad, and but very few, becauſe the very firſt years tryall will put you into ſufficient experience. As the Woad yeelds many Crops, ſo each Crop is worſe than other, the firſt Crop is beſt, and the ſecond next, and the third much worſe, and the fourth far worſe than that, and the fifth worſt of all; if you get a fift but that is not uſuall, four Crops is ſufficient, and ſometime you muſt be content with three, and as the firſt Crop is uſually (in a good kind year) ripe by the mid'ſt of *June*, ſo will the ſecond be uſually ripe within one month after that, and ſo every month or thereabouts each Crop will be ready, and if the latter end of the year prove kind, then you may expect a Crop the more.

When Woad is ripe.

Now to know when the Woad is ripe, and to take it in the very ſeaſon, is a fundamentall peece, wich is, when the leaf is come to a full growth, and retaines it perpect colour and lively greenneſs, then with all your might ſet ſo many hands to cutting of it, as that it begin not to fade or wax pale or wan before you have cut your crop, for then it begins to be over-ripe, and the ſap and marrow of it drinks in again and will not yeeld ſtore of juyce, which is the ſpirit of it and beſt of Woad.

The Woad-man ſeaſons the two firſt Crops together, and ſome ſeaſon the third by it ſelf, and the fourth by it ſelf, and ſome put the three firſt Crops together, which makes the worſer Woad, but the very virgin Woad is the firſt and ſecond, and the better they deſire to make it, the more intire they compound it, not confounding it with divers ſorts.

The beſt Woad for uſe.

The manner of ſeaſoning is thus, after every crop is cut, and grinded, balled and dryed, as dry as can poſſibly, and laid up in the ball every crop by it ſelf, then you muſt take the firſt and ſecond Crops and grind them all over again together, or apart if you pleaſe, but they muſt be then wrought

to

to duſt as it were in the mill, and ground very well the firſt and ſecond Crop, or ſo much as you will make of your beſt ſort of Woad, and ſo laid upon a floor in a heat or couch, and then you muſt mix it with water, and turn it over, and ſo mix it again, and turn it over, and give it ſo much water as that it be all ſoked throughly, however you may overſoke, and drown it, and that is very prejudiciall to it, it muſt be turned in the couch every day once for three or four weeks together, and then every other day once for about a fortnight, and then twice a week till it be come to a right temper, at the firſt many men muſt be imployed carring water as hard as they can till it be all of it wet and well ſoaked, and that you may know the better how to temper it aright, you ſhall find it heat exceedingly in the couch, which you muſt look to keep in a moderate condition; which overheatiug you may prevent with turning, that it overheat not by any means, it may grow ſo hot as you can poſſibly abide your hand in it, but not to exceed that heat; and how to know it ſeaſons kindly, & ſo will in time come to perfect rich Woad, you muſt obſerve that it will alter and change divers times, firſt it will mould, hoar and froſt, and ſmell exceeding ſtrong; then it will in a little time abate thereof and grow toward a black colour, and then it will hoar or mould again, and change a little whitiſh, and after this ſecond change it will come to a perf & black, which the brighter and clearer colour the better; This muſt be the winters work, and it will be good for cold weather, and when it is thus wrought and comes to its colour, then you may lay it up or heap it up, to lie for a ſale, putting divers p les into each heap to the bo tom to open it, and keep it Cool, and you muſt be ſure it take not heat again; and thus all your ſorts of Woad muſt be ſeaſoned one after another, and eſpecially all ſuch as you can dry that ſummer, bnt to tell you how to know or choſe the beſt Woad is ſcarce in the power of the Woad-man, who can but gueſs at it from that experence he hath in the mixing of it, but it muſt be tryed by the dyer, who uſually will before they buy any quantitie.

The way of ſeaſoning Woad.

How hot the Woad ariſeun-to in the couch.

that whereas (though very rarely) it is now planted in ſome gardens, and in ſome ſmall plots of ground, and doth amount unto a very great advantage to the Planter, by the ſets they ſell forth, and by the roots they draw to vent to the Apothecary, and medicinably to others, and yet ſo make a moſt excelling vallew of their Lands indeed beyond credence, ſome have made as I have been moſt credibly informed after the rate of three hundred pounds an Acre in three yeares, for ſo long it grows before it come unto perfection, and others that have ſold it whole-ſale a parcell together at the worſt advantage after one hundred and ſixty pounds *per* Acre, and ſome have out of ſmall plots in gardens made more than I have or will here affirm, and however, though I ſhall be ſo modeſt as to confeſs that much of your garden ſtuff may yeeld with the coſt and labour that is continually applyed thereto, as much or more than here is ſpoken of as I am confident. I could name divers things which ſome preſerve as rich Treaſure in their barns aud will not diſcover them, yet this I ſhall affirm, that this being a fundamentall fruit, and ſuch a one as that the plenty thereof will not much abate the market, Our dying trade being ſupplyed herewith from beyond the Seas, that the Erection of ſuch a Plantation as may bring it forth wrought up and fitted to the dyars uſe, and ſo be a ſupply to our ſelves within our ſelves, I am confident is a deſign of incomparable good, to the Common-Wealth eſpecially, it imploying ſo many hands as will be to bring it to perfection: It is like to prove a ſtaple commodity, and will turn land to as great an advance as any ſeed or root that it is capeable to receiv, and need no more fear want of markets for the venting of it, than wee need for wooll that ſtaple commodity of the Nation. And becauſe the diſcovery thereof is a matter of ſo great Importance, I ſhall ſpend a little more time in the diſcovery of the whole frame hereof.

what it yee'ds an Acre.

And I ſhall proceed to the deſcription of it.

There is but one kind of Madder which is manured and

ſet

The description of Madder.

set for use, but there is many things like thereto, as Goose-grass, soft Cliver, Ladies Bedshaw, Woodroof and Crosswort, all which are like to Madder leaves, and are thought to be wild kinds thereof; It hath long stalks or trayling branches dispersed upon the ground, rough and full of joynts, and every joynt set with green rough leaves in manner of a Star. The flowers grow at top of the branches, of a faint yellow colour, after which comes the seed, round and green. The root creepeth far abroad within the upper crust of the Earth, intangling one root into another, and when it is green and fresh, the root is of a reddish colour, it is small and tender, but gathers and runs in the ground just like an Ivy along a House or Tree. It is a commodity of much vallew. Patentees strove hard for it, and Patents were gained about it in the late Kings daies, and yet now in these times of freedom who pursues it?

For the making out a good Plantation hereof, I must do these three or four things.

1. Shew you what it comes of, and how to Plant it and preserve it.

2. How to get it and use it, to bring it to saleable Madder.

3. The benefit and advantage nationall and personall.

Although it bear a seed, yet that seed comes not to perfection here, it is therefore to be Planted of the sets that are to be gotten from the Madder it self, and they are to be bought in many gardens in *London*, who keep up that Plantation for the advantage of selling their sets and roots Physically to the Apothecaries onely, all the skill is to distinguish of the goodness thereof: And for the discovery thereof, first know the season of getting of rather drawing them, which is in *March* and *Aprill*, yea as soon as they are sprung forth of the ground two or three inches long, then you must be carefull you get sets rooted; Every set having some suckors or spinies of root going out from them, they must be slipped from the main root,

The seasons of drawing the sets.

root, and theſe ſets as ſoon as ever took up, put into ſome basket with a little mould, and poſted to the place where they are to be ſet, the ſooner the better; and then your ground being very rich, it cannot be too rich for this commodity, however it muſt be a warm and very deep ſoil, and digged two or three ſpade graft depth, and two ſhovellings alſo, and raked and laid even and levell, and then by ſtreight lines trode out into long beds about four foot broad from one end of your work into the other, and ſet about one foot a ſunder every way, and if it be a dry ſpring they muſt be kept with watering untill they recover their fadeing wan condition; you may begiu to dig your ground in the beginng and ſo all along Winter till the very day of ſetting, and then you muſt keep it with weeding and hoing till it have got the maſterſhip of the weeds, and then it being a weed of it ſelf will deſtroy all other.

What ground is beſt, & how to prepare it.

One rod of ground is worth ſeaven pence a rod digging, or if very dry ſtrong ground, eight pence, but ſix pence the beſt ground will require, and you may ſow ſome early ſallet Herbs, or Reddiſh, or Onions, or ſuch things as will be ripe betimes, among it; the firſt year good weeding is the beſt preſervative unto it, and in your ſetting of them by a line, one goes before and layeth every ſet in his place, and another comes and with a board dibble made for purpoſe, thruſt down deep and open a hole, and put in the ſet, and for the nouriſhing of it, in caſe any die you muſt plant new in the room of what decaies, for the time of the growing of it untill it come to perfection is three yeares, the firſt yeare you may take off ſome few ſets here and there, but that is ſomewhat dangerous, but that year it muſt be kept with hoing a while alſo, and then the ſecond year you may take up ſets as faſt as you will, and almoſt as many as you wil; leaving but as you do in the croping of an Oak one bough for the drawing up the ſap out of the root being ſo thick and ſtrong in the ground that nothing will decay it almoſt; if thou haſt but a reaſonable quantity,

A rod of ground what worth ſetting.

At what diſtſtance and how to ſet them.

When to get ſets of our own planting.

then thou must get it for the use of the drugsters and Apothecaries, and the sets to Plant again, and then in the taking up of every root there will be one runner which hath little buds upon it, the which may be divided and cut into a fingers length, each so Planted with one bud out of the ground set upright, which makes very excellent good sets, one runner will make many sets, but these sets cannot be got up untill the Madder be taken away: And having thus preserved it untill it come to a good crop, if thou intendest it, and hast a quantity sufficient to set up a Madder Mill, having curiously dryed it as you do your hopps to a just & perfect gage of drought; Thou must provide all materialls to that purpose; the Mill I cannot well describe, and it is exceeding curious to be made aright, & I do not hear of any one can do it, yet possibly there may be some Engineer or some Dutch man here that can do it; it being a common Mill in *Holland* and the Low-Countries, which is the only place for Madder that I hear of in the World. A rude discovery I could give, but I will forbear, lest any one taking pattern by it should abuse himself more and me in some measure, yet here is the mystery of it; so to pare off the husk that it may be if possible (as the wheat is ground) beflaked or flayed that it may go all one way, which sort they call the mull Madder and is little worth, not above nine or ten shillings a hundred, and then you must take out the second sort called the number O which is the middle rinde, and is not worth so much as the third sort called the Crop Madder, by one sixth part, and this crop Madder is the very heart and pitch of it inclining to the yellow, and this lesser in quantity but better in quality by far. Sometimes the best Madder is worth eight or nine pound a hundred, and the number O is worth but six pound six shillings o pence, or eight pound two shillings six pence, and sometimes it is not worth above four pound or five pound a hundred, yea sometime it may come to three pound the hundred possibly, and because I would not abuse the Reader, I advise my Madder-Planter to send over for a workman

workman thence, who can both deſcribe the Engine, and the manner of mixing and ſorting of it, which is the greateſt myſtery, and well worth your labour and pains it will be.

At *Barn-Elms* was once Madder ſowen & brought to good perfection, and a Mill erected by one Mr. *Shipman* the late Kings Gardner, who had a Patent for it from the late King, but being as I am informed, a poor man, was not able to carry it on for want of ſtock, and as I conceive theſe times coming on broke his nevv Plantation, but one Mr. *Haſſey* bought his Madder, vvhich proved excellent good, and ſold it again to the Dyars, who exceeding highly commend it.

Madder planting formerly granted by Patent

Which is ſufficient proof to me that we may raiſe & make as good as any is in the vvorld, and why not as vvell as *Holland?* our Lands both Marſh, Fen, abundance of Up-land and Meadow is as rich, dry, and deep of ſoyl and good for it as theirs is, and vve have uſe enough for many thouſand vweight of it, ſome Dyars uſing above 100 pound a week a man.

The profit I ſhall not determine, becauſe it vvill be long before a thorough tryal can be made of it, but novv as it is planted in Gardens unſpeakable advantages are made thereby, and ſhould it hold that proportion vvhen it comes to be made up and compleated to the Dyars, it vvould prove the richeſt commodity that I know ſowed in *England.*

I hear Sir *Nicholas Criſp* is erecting a Plantation of it, his ingenuity is to be commended highly in many things, and for his publique-ſpiritedneſs countenanced in a vvork that is ſo likely to tend to the publique good. I knovv none can drive on publique ends vvithout private aims; neither know I well why he ſhould to his own ruin; but he that drives on his private, ſo as the publique ſhall be moſt advanced, from men deſerves great honour; and thou that repineſt, ſet ſuch another work on foot, and then thou vvilt grovv more charitable. But I ſhall ſay no more, but humbly pray all encouragement may be given hereunto; for could it be brought to that perfection as Woad is here, it might be as great an addition to the nation as any thing I can diſcover. I have done.

At Dedford by Greenwich is his Plantation.

The Fourth Peece of Improvement hath respect unto the Plantations of Hops, Saffron, and Liquorish, both in relation to the mystery thereof, and profits thereby.

CHAP. XXXVII.

Onely treats of Hops Plantation, and how Land is Improved thereby.

AS for Hops it is grown to a Nationall commodity. But it was not many years since the famous City of *London* petitioned the Parliament of *England* against two Anusancies, or offensive commodities were like ly to come into great use and esteem, and that was *Newcastle*-coal, in regard of their stench, &c. and Hops in regard they would spoyl the taste of drink, and endanger the people, and for some other reasons I do not well remember, but petition they did to suppress them, and had the Parliament been no wiser than they, we had been in a measure pined, and in a greatere measure starved, which is just answerable to the Principles of those men that now cry down all devices or ingenious discoveries, as projects, and so this day thereby stifle, and choak Improvement; yet we see what nationall advantages they have since yeelded, and no less will many of the other.

This Hop plantation would require a large discourse, but I shall contract my self to the briefest discovery thereof I can possible, and therefore shall under three or four Heads,

1 Shew you the land is best for them, and best Sets to plant withall.

2 The manner of planting them, and husbandring them untill they be fit for sale.

3 The profit and advantage that will accrew thereby.

I ſhall deſcribe it thus, it comes up with ſeverall ſprouts like Sparrowgraſs, runs up and climbs on any thing it meets withall, bears long ſtalks, hairy, and rugged leaves, broad like the Vine, the flowers hang down by cuſhers, ſet as it were with ſcales yellowiſh, called in High Dutch *Lupulus*, in Low Dutch *Hopſſem*, and in Engliſh Hop. It is offenſive upon this ſcore, hot in the firſt degree, ſtuffs the head with the ſmel, therefore uſe it not too much, yet the leaves open and cleanſe.

1 The beſt land is your richeſt land, and in time you muſt gain therein, leſt another reap the benefit of your labour.

Beſt Hop-land.

It muſt be a deep mould, that which lyeth near the Rock the Poles cannot be ſet deep enough to ſtand firm; it would be a mixed earth that is compounded of ſand and a little clay, but much ſolid earth; a ſtrongiſh land layd dry and warm will bare the moſt weightieſt Hops.

How a hop-garden ſhould ſtand.

A barren, moriſh, wet foyl, is not naturall to the Hops delight, but if this be layd very dry, and made very rich with dung and ſoyl, it may do reaſonable well.

It will be beſt to ſtand warm if may be, preſerved from North and Eaſt winds, rather by hils than trees, as near your houſe as may be, and that Land you determine for your Hop-garden, lay as levell and as ſquare as ye can poſſible, and if it be rough and ſtiff, it will do well to be ſowed with Hemp, Beans or Turnips before; but in what ſtate ſoever it be, till it in the beginning of Winter with plough or ſpade, and this not onely the year before, but every year ſo long as you uſe it, and the more pains and coſt you beſtow, the more profit, and the nearer you reſemble the *Flemming* in his Hopping.

Beſt hop-ſets, and where to have them.

And for your Sets, thoſe are your Roots taken from your old hils and roots, go to a Garden orderly kept, where the Hops are of a good kind, all yearly cut, and where the hills are raiſed very high, for there the roots will be greateſt, and buy choice Sets; they may coſt ſix pence a hundred, and ſometimes have them for taking up, leaving things orderly and their hill well dreſſed.

You muſt chuſe the biggeſt roots you can find, ſuch as are three or four inches about, and the Set nine or ten inches,

long, and have three joints in a root.

Take heed of Wild-hops, they are onely discerned by the fruit and stalks.

Signs of an unprovable hop.

The unkindly Hop that likes not his ground, soyl, or keeper, comes up green, and small in stalk, thick and rough in leaves like nettles, much bitten with a black fly, but it destroyes not the Hop, but hurteth it somewhat, and so you have the first particular.

2 The manner of planting, as soon as your roots are got, either set them speedily or lay them in some puddle, or bury them in earth: but leave them not in water above four and twenty hours.

How to make the hop-hills.

Then begin to direct your hils with a line, tyed with knots or threads thereto, the due distance had need to be 8 foot betwixt, because then you may make the fewer and bigger hils, the sun comes about them, the poles reach not one another, and so it may be plowed yearly, otherwise it must be digged; some say seven foot, and others say six foot, as our late accustomed manner is, and I am confident there is most advantage by thin planting, but that I leave to each experience.

Your hole under the knot of your line had need be a foot square and deep, then if you can have the wind South or West it is best, if not, goe on, having made many holes, matter not the wind: be sure to take the moneth of *April* for the work, and take two or three of your roots, as a great old Gardiner affirms, which by this will yeeld green Sciences or white buds, and will have small beards growing out, and joyn your sets together even in the tops, and set them altogether bolt upright, and there hold them in their place till you have filled the hole with good mold, and set low, but just as the tops may be level with the ground, and then after they must be covered two inches thick with fine mould; bee careful you set not that end downward which before grew upward, which you know by the bud growing upward, and let no part of the dead stalk remain upon the uppermost joint thereof, then press down the earth hard to the roots; some will set them every one at a corner of the hole under the line which I rather encline to, because they have room and stand round

The very time to plant in.

The best manner of setting the sets.

round; but if you plant late, and have green Springs upon them, then be carefull of not covering the Spring: but to ſet more plants leſt ſome ſhould fail, and in a bigger hole, and round about the ſame ſet 8, ſome ſay ten or more, which is thought tedious, but I will make a tryal thereof, it being the lateſt experimented in our dayes; now at this time you need make no hils at all alſo then, as aforeſayd. Poultery muſt be preſerved from ſcratting, the Gooſe eſpecially.

How to pole them, & which poles are beſt.

Now for Poling, if your diſtance be 3 yards, or 8 foot, then 4 poles are required, elſe three will ſerve, but I encline to 6 or 7 foot diſtance, and 4 poles, and as many this year as any.

Alder poles are very good, taper and rough, and ſutable to the Hops deſire, but you muſt take ſuch as the Country will afford.

The time of cutting your poles is in *December* or *November*, and then dreſs them and pile them up dry; if you leave ſome twigs it will not doe amiſs.

Poles length.

For length, 15 foot is a good length, except your ground be very rich, or your hils exceeding heightned, or if they grow too thick your poles need to be the longer. The Hop never ſtocketh kindly untill it reach higher than the pole, and returneth a yard or two; for whilſt it is climbing, the branches that grow out of the principal ſtalk grow little or nothing. Your poles be ſtrong, 9 inches about the bottom they ſtand faſter: 150 poles make a load, which may be worth a little more than ordinary wood; a few will ſupply the ſtanding ſtock; in ſetting your poles lay all to each hill you intend to ſet, which ſpeeds the work.

The beſt ſort of poling.

And ſpeedieſt way

When your Hops appear, as you diſcern where your principal root ſtands, then ſet to poling, having a crow of Iron to make entrance for the pole; but if you ſtay longer, then you will be more ſubject either by ramming or making holes to bruiſe the root, or elſe they will not ſo eaſily catch the pole without flying.

And beſt ſeaſon.

Your foot of the pole muſt be ſet a foot and half deep, and within two or three inches of the principal root; but if your land be rockey, then you muſt help your ſelf by making your hill higher to ſtrengthen your poles, for which you muſt ſtay the longer too leſt you bury your Sciences. Your poles of each

hill

hill leame them rather outward one from another, and then with a rammer ram them outward and not inward.

If a pole should break you take away the broken pole, and ty the top of those hops to the top of a new pole, then winding it with the sun a turn or two, set it in the hole; but if you can take a stake and ty it too without wresting the wiers of it may do wel to peece; but if broken at the neather end, shove the pole in again; and if your poles break in the pulling up, or will not be drawn by reason of drought or hardness, you may make a pair of pinsors of 4 foot long, with an iron running hook upon them, and with a block layd under upon the top of the hill, and so coleweigh up your pole; the mouth whereof made hollow. And for laying up your poles, the usual way is to tie two and two together in the top, being set in 6 opposite hils, and so raise a little earth betwixt the hils as if they were but three hils, and lay some hop-bands upon the three hils under your hop-poles, and so draw your tops nearer together, or further off as you see cause.

How to draw broken hop-poles.

How to lay the poles.

When you hops are grown two foot high, bind up with a rush or grass your binds to the poles, as doth not of it self, winding them as oft about the poles as you can, & wind them according to the course of the sun, but not when the dew is upon them: your rushes lying in the sun will toughen.

How to turn the hops to the pole.

And now you must begin to make your hils, and for that purpose get a strong Hoe, of a good broad bit, and cut or hoe up all the grass in the borders between your hils, and therewith make your hils with a little of your mould with them, but not with strong weeds, and the more your hils are raised, the better, the larger, and stronger grows your root, & bigger will be your fruit: and from this time you must be painfull in your garden, and ever and anon till the time of gathering, in raising your hils, and clearing your ground from weeds.

One of the main things in the hop-yard is raising the hils

In the first year suppress not one science, and suffer them all to climb up the poles, and should you bury the springs of any one of your roots it would die, so that the more poles are required to nourish the spring. But after the first year you must not suffer above two or three stalks to grow up to one pole, but pull down and bury all the rest. Yet you may let them grow four or five foot long, and then chuse out the best for use

At first suppress not one science.

uſe. As ſoon as your pole is ſet, you may make a circle how broad your hil ſhall be, and then hollow it that it may receive the moyſture, and not long after proceed to the building of your hils.

And where you began, or where your Hops are higheſt there begin again, and pare again, and lay them to your hops, but lay the out-circle higheſt to receive moyſture; be alway paring up, and laying it to the heap, and with ſome mould untill the heap comes to be near a yard high, but the firſt year make it not too high, and as you paſs through your garden have a forked wand in your hand to help the hops that hang not right.

How to heighten your hils.

Now theſe hils muſt the next year be pulled down, and dreſſed again every year. Some when their hop bind is 11 or 12 foot break off the tops, which is better than they that have their poles ſo long as the hop runs: but if that your hop by the midſt of *July* attain not to the top of of your pole, then break off the top of the ſame hop, for then the reſt of the time will nouriſh the branches, which otherwiſe will loſe all, it being no advantage in running up, to the ſtock or increaſe of the hop.

When to break off the top of the hop bind

When hops blow and bell, and are ripe.

Now we come to the gathering of them, about *Margaret's* day hops blow, and at *Lammas* they bell; but when your hops begin to change colour is a little before *Michaelmas*, but long before ſome will turn and change and grow ripe, which howſoever the beſt way will be to pull them, and not ſuffer them to ſhed; they are called Midſummer hops; let them not grow till the other be ripe; and as ſoon as the ſeed of the reſt begins to change, then get pullers amain, and as many as you can, taking a fair ſeaſon; and note, you were better to gather them too early than too late.

How to pull your hops.

Therefore for neatneſs ſake, pul down 4 hils ſtanding together in the midſt of your garden, cut the roots, pare the ſame plot level, throw water on it, tread it, ſweep it, and make it fair, wherein the hops muſt lye to be picked.

Then begin and cut the ſtalks cloſe by the tops of the hils, and cut them aſunder that grow one into another with a long ſharp hook, and with a fork take them down; you may make the fork and hook one apt inſtrument with which you may ſhove off all from the pole, & carry it to the place. But I have ſeen of late they carry pole and all to the place and pick them off the pole: ſtraight fine poles is beſt for this way, but cut no more ſtalks than you can carry away in the ſpace of one hour aforehand; for either ſun or

ain will offend when they are off the pole; your must all stand round the floor, and speedily strip them in baskets; for it is not hurtfull though some smaller leaves fall among them.

Neatness about them is very good.

And clear your floor twice a day, & sweep it, and if the weather be unlike to be fair, they may be carried into the house in blankets, but use no linnen, it will stain to purpose. And if you pull them upon poles, then lay them upon forked stakes, and dispatch them, be careful of wet, lest they shed their seed, which is the marrow of them. When you have leisure take up your poles and pile them, and carry out your straw, and so depart your garden till *March* unless it be to bring in dung. And for the advancement of your Hop-garden, get dung into your garden, & lay on some in winter for to comfort and warm the roots, your hils pulled down, and let your roots lye bare all winter season: your old dung is best, rather none than not rotten.

How to dress & pruin the roots in Winter.

And in *April* help every hill with a handfull or two of good earth when the hop is wound about the pole, but in *March* you will find, unless it have been tilled, all weeds; but if you have pulled down your hils, and layd your grouud as it were levell, it will serve to maintain your hils for ever; but if you have not pulled down your hils, you should with your hoe as it were undermine them round till you come near the principall, and take the upper or younger roots in your hand, and discerning where the new roots grow out of the old sets, of which be carefull, but spare not the other; but in the first year uncover no more than the tops of the old Sets, but cut no roots before the end of *March* or beginning of *April*. The first year of dressing your roots you must cut away all such as grew the year before, within one inch of the same; and every year after cut them as close to the old roots; those that grow downward are not to be cut, they bee those that grow outward, which will incumber your Garden, the difference between old and new easily appeares; you will find your old sets not encreased in length, but a little in bigness, and in few years all your sets will be grovvn into one; and by the colour also, the main root being red, the other white, but if this be not early done, then they will not be perceived; and if your Sets be small, and placed in good ground, and the hill well maintained, the new roots will be greater than the old; if they grow to wild hops, the stalk will wax red, pull it down,

and

and plant new in their places. As for the annuall charge of the Hop-garden after it is planted, the dressing the hills, the alleys, the hoing them, the poling, and tying to the poles, and ordering the hops is usually done for 40. s. an Acre, and pulling, and drying, and bagging by the day. The charge of setting & dressing hops.

And so I shall proceed to the drying of them, which may bee done upon any ordinary kiln, with any wood that is dry, but not too old; or else good sweet Rie straw will do well, but charcoal best of all. How to dry hops.

They must be layd about 9 or 10 inches thick, and dried a good while on that side, & then turned upside down, and dried as much on the other side. About 12 hours wil dry a kiln full, which must be followed night and day, and then layd up in a close room upon a heap together for a month if your markets wil give way to frume and forgive again. When the stalk begins to be brittle, & the leaf also begins to rub, then the hop is dryed sufficiently, but tread them not while they are hot, it will tread them to dust; and then either against *Sturbridge* Fair, or what other markets thou provideſt for, thou mayst bag them up as close & hard as is possible, either to 200 or 200 and a quarter in a bag, as thou pleasest, but the usual bag is 200 & a quarter. The sign when they are dry enough.

And so I come to my third particular, to shew you the profits and advantages that are to be gained thereby. One Acre of good hops may possibly be worth at a good market 40, 50, or 60 pound: An Acre may bear 11 or 12 hundred weight, possibly some have done more, many ten, but grant but 8 hundred, they are sometimes worth not above 1. l. 4. s. the hundred, and some other times they have been worth 12 or 14. l. a hundred, and usually once in three years they bring mony enough. It is an excellent commoditie if curiously and well husbandried. I know in common waies of hopping, a Gentleman hath made of two Acres and a Rod 180. l. in one year; the same ground hath after it hath been improved let for 20. l. *per an.* to a Hop-master; nay I beleeve I could easily president you with 100. l. that hath been made of one Acre, and may be more. It is usually a very good commodity, and many times extraordinary; and our nation may ascribe it unto it self, to raise the best Hops of any other Nation. The constant charge of a Hop-garden is usually known, men order and dress them at a rate by the Acre all the year. And this very way I fear not to make out my Improvements promised. The profits may be made of hops.

CHAP. XXXVIII.

Treats of the mystery of Saffron, and way of Planting of it.

THere is another very rich comõdity wherein our Nation hath the glory, & yet is a very mystery to many parts of it, they know not whether such a thing grows in *England*, and yet none such so good grows in the world beside that I have ever read of, and that is Saffron. Now Saffron is a very soveraign and wholsom thing, and if it take right it is of very great advantage for price; it hath its ebbings and its flowings, as almost all things have, yet I would fain give encouragement to this Improvement also. I shall briefly give you the story of it; Good land that is of the value of 20.s. an Acre, being well husbandryed, tilled, and fitted, or worser land being well manured, and brought to perfect tillage will serve the turn; but the better, the better for the work. The season is about *Midsummer* which it is to be set, that being the season they usually take up, or draw their sets or roots and old store, when they may be had, and no time else. The land being brought into perfect Tillage, the best way is to make a tool like a hoe in operation, but as broad as six of them, it may be 15 or 18 inches broad, and with that they draw their land into ranges, open as it were a furrow, about 2 or 3 inches deep, and there place their sets or roots of Saffron about 2 or 3 inches asunder (which roots are to be bought by the strike, sometimes dearer, and sometimes cheaper, and are very like an Onion, a little Onion about an inch and a half over) and as soon as they have made one furrow all along their land from one end to another, then they, after that is set, begin another, and draw that which they raise next to cover this, and so as they make their trench, so they cover the other; they keep one even depth as near as may be, which ranges or furrows are not above three or four inches distance, that so a hoe of two or three inches may goe betwixt them to draw up the weed, which being set and covered, it may come up that summer, but it dies again, yet it lives all winter, and grows green like Chives or small Leeks, and in the beginning of summer it dieth wholly the blade of it as to appearance, that so one may come and take a hoe and draw all over it, and cleanse it very purely

Best time for Saffron

How to set Saffron.

Saffron as green as a leek in Winter.

purely and then will come up the flower without the leaf, and in *September* the flower of it appeares like Crocus that is blew, and in the middle of it comes up two or three chives which grow upright together, and the reſt of the flower ſpreads broad, which chives, that is the very Saffron and no more, which you may take betwixt your fingers and hold it, and caſt away all the reſt of the flower, and and reſerve that onely, and ſo they pick it, and they muſt pick it every morning early, or elſe it returnes back into the body of it, or the earth again, untill next morning, and ſo from one to another, for a months ſpace will it bear Saffron, you muſt get as many pickers as may overcome it before it ſtrike in again at the very nick in the morning.

How to pick Saffron.

It will grow to bear 2 crops and then it muſt be taken up, and planted new again, and then it will yeeld good ſtore of ſets to ſpare, which cannot be had no other way, it muſt be taken up at Midſumer and then ſet as aforeſaid. And when you have got your Saffron, then you muſt ſet a drying of it, and that you muſt doe make a kiln of clay, not half ſo big as a Bee hive, and very like it it will be made with a few little ſticks and clay, and ſerve excellent well, for this ſervice, a little ſmall fire of charcole will ſerve to dry it, and it muſt be carefully tended alſo.

How to dry Saffron.

Three pounds of wet Saffron will make one of dry Saffron.

An Acre of Land may bear 14 or 15 l. of Saffron, if very good, but if but 7 or 8 l. it will do the work; And one Acre of it will be mannaged with no great charge, I do not believe it can come to 4 l. an Acre, it hath been ſold from 20 ſ. a pound to 5 l. a pound. It is an excellent advantage, and brings in at worſt a ſaving bargain, but it may poſſibly be wotth 30 or 40 l. an Acre; but if it come but to 7 or 8 l. it loſeth not, ſo I have given thee a brief ſtory wherein I would have been more large but having loſt my obſervavions upon it which I took when I was upon the very Lands, and received full ſatisfaction in every particular and member, or branch thereof, but as yet it hath not fell under my own experience; therefore I give the heads as I remember, as they were delivered unto me upon the place, though I have forgot many of them, to incourage to the work.

The Saffron Country.

The Saffron Country is on one ſide and nook of *Eſſex*, and ſome part of *Suffolk*, and at at Saffron *Walden*, and betwixt that and *Cambridge* is very much of it in their common fields, and

truly these Lands are but of a middle worth. I have seen as rich land again in many parts of *England*, but it is as I believe loamy ground and of a little saddish nature, it will require to be laid dry and sound, and the land it self must be very sound wholsom Land.

CHAP. XXXIX

Treats of the Plantation of Liquorish at large.

I Proceed to another Nationall business, in the Plantation whereof wee exceed all Nations, and that is Liquorish, our *English* Liquorish as wee call it, not yet wrote of by any that I could ever see, is far beyond the Spanish small dry Liquorish or any other.

As for the use of it most know, but as to the profit and advantage, and the mystery of Planting of it but few understand, and fewer practise; but that I may be as open and full in the discovery of it as I can in this short discourse I have to make, I shall under these two or three heads formalize what I intend to speak.

1. Shall be to discover the best Land to bear it.
2. The best way I can find practised to plant it.
3. The profits and advantages of it.

The best land for Liquorish.

The best Land to raise your Liquorish upon is your richest you can get or make, your warmest you can find out, the soundest and dryest that possible is to be had, of a very deep soyl, you must dig and prepare your Land before you set, and it must be digged three spades depth, and two or three shovellings at the least, laid as hollow and light as may be: you may have it digged out of naturall Land (if it be very rich indeed, that it will feed an Oxe in a summer, it is the best) for eight pence a rod at *London*, yea for seaven pence and sometimes for six pence a rod, forty rods make a rood which is a quarter of an Acre, which comes to about four or 5 l. and this is the main charge of all for three year, there is no more unless it be a little hoeing, which will off hand very fast, I believe it will not cost above 20 s. an Ancre more all three yeares both in the setting and all the dressings

The charge of workmanship.

dreſſings of it, beſides the ſets and Land: The ſets being doubly & trebly worth your money; ſets have been ſold for 2 ſ. the hundred and more, ſometimes are not worth above 1 ſ. a hundred, but if your Land be not freſh old Land, or extraordinary rich, and as rich as your beſt gardens are, it muſt be made ſo with ſoyles and warm Manures, horſe-dung is excellent to be intrenched into the Earth, it both warmes and lightens it, and makes it very fit for this ſervice. About *London* is very ſerviceable Lands for it, and ſo is on any dry ſoyl whatever where it is rich enough and deep. Holland in Lincolnſhire muſt needs be very good, many of the Marſhes that are ſandy and warm moſt excellent, that which bears this well, will alſo bear your Madder-weed that rich commodity: I hear that Liquoriſh grows naturally at *Worſop* in *Notthinghamſhire* and about *Pompbret* in *Yorkſhire*, ſo alſo I hear your ſparrow-graſs grows naturally at *Moulton* within a few miles of *Spauldwin* in *Linconſhire*, and ſo I proceed to my third particular.

Price of ſets

The place where beſt lands lye for this uſe.

Which is the beſt experimented way of planting of it.

Having digged and prepared your Land, and a little raked and evened the ſame, you may proceed to the Planting of it, and therein you muſt indeavour the procuring of the beſt ſets you can, and from the beſt and largeſt ſort of Liquoriſh. The beſt ſets are your Crown ſets or heads got from the very top of the root a little ſhived down; be careſull of this, of very ſound Land, for how ſoon ſoever you come to the water your Liquoriſh will check and run not one inch further, and having procured your ſets your ground being caſt into beds of 4 foot broad, all along your plantation, from one end to the other by a long line, you may lay down a ſet at every foot along the line, which line may have knots or thrids at every foot, if you be ſo exact, and then a man come with a tool made a little flattiſh if you will, or roundiſh, of the bredth or bigneſs of a good pickfork ſtaile, about half a yard long with a crutch at the over end, and ſharp at the neather, and that thruſt into the ground, it being made of wood or iron, but if flat, an iron one will do beſt, and open the hole well, and put in the ſet, and cloſe a little mould to it, and ſo you may overrun an Acre very quickly in the ſetting of it, and if it ſhould prove a very dry time, you muſt water your ſets two or three daies at firſt, untill you ſee they have recovered their

How to ſet your Plants.

If dry, water your ſets.

whithe-

witherednes and wanneſs, and then the firſt year you may Plant your garden with Onions, Reddiſhes, or any ſallet herb or any thing that roots not downward, and I am confident it will be better too, becauſe it will prevent ſome weeding, and for the ſecond it muſt be hoed and kept from weeds too, and a little the third; but one thing be very curious off, in the taking up and ſudden ſetting thy ſets, as ſoon as took up ſet again, but if you fetch from far, then as ſoon as taken up, put a little mould and poſt them away by horſe back, and get them into the ground as ſoon as poſſibly, the delay of ſetting, ſpoiles many thouſand ſets. The ſeaſons of planting is in the month of *Feb.* and *March* You may the ſecond year take ſome ſets from your own ſtock, but be very curious thereof, but the third year you may take what you pleaſe, and in the taking of the Liquoriſh up, the beſt ſeaſon for which is in *November* and *December*, then there runs from every maſter root, a runner which runs along the over part of the ground, which hath little ſprouts and rootes or ſciences, which will yeeld excellent ſets, if they be cut 3 or four of them in every ſet, which may be about 4 or five inches long, which is alſo to be Planted, and is as good as the crown ſet, alſo if it be any thing a moiſt time, you may take ſlips from the leaf or branches and ſet them, and they ſome of them will grow, but they may be ſet betwixt the other to thicken, leſt they ſhould fail.

Time of planting.

The Runner yeelds good ſets.

There is abundance of Spaniſh ſets come over of late, One M. *Walker* ſells of them at *Wincheſter* houſe in *Southwark London*, but how good they be I am able to ſay little, but hear various reports of them, and therefore I will forbear, they are bought cheaper than Engliſh ſets can be, but if they bring forth a ſmall Spaniſh Liquoriſh I ſhall not much affect them.

The third particular is the profit and advantage may be made thereby which is very conſiderable, but it is alſo ſubject to the ebbings and flowings of the market. It muſt be taken up in winter, and muſt be ſold as ſoon as taken up, leſt it loſe the weight which it muſt needs do, you may make of one Acre of indifferent Liquoriſh 50 or 60 l. and of excellent good, 80. 90 or 100 l. it is not of ſo great uſe as ſome other commodities are, and ſo will not vent off in ſo great parcells as others will, neither will it indure the keeping for a good market becauſe it will dry exceedingly.

When taken up, and when ſold.

The advantages thereof.

CHAP.

The Fifth Piece containes the Art of Planting of Rape, Cole-ſeed, Hempe and Flax, with the ſeverall advantages that may bee made of each.

CHAP. XL.

Only contains the Diſcovery of Rape and Cole-ſeeds husbandry

THe planting of Cole-ſeed, or Rape-ſeed is another excellent good meanes for the improving land; the Cole-ſeed is of late dayes beſt eſteemed.

And it is moſt eſpecially uſefull upon your Marſh-land, Fen-land, or upon your new recovered Sea-land, or any lands, very ranke and fat, whether areable or paſture.

The beſt ſeed is the biggeſt, faireſt ſeed that you can get, it being dry, and of a pure cleare colour, of the colour of the beſt Onion-ſeed. Beſt Seed.

It is to be had in many parts of this Nation, but *Holland* is the Center of it, from thence comes your good ſeed uſually.

The ſeaſon of ſowing, is at, or about Midſummer, you muſt have your land plowed very well, and laid even and fine, whether upon the lay, turfe, or areable, and both may doe well, but your areable muſt bee very rich, and fat, and having made your land fine, then you may ſow it, and about a gallon of ſeed will ſow an Acre, the which ſeed muſt be mingled, as afore was directed about the Claver, with ſomething, that you may ſow it even, and not upon heaps; the even ſowing of it is very difficult, it grows up exceedingly to great leaves, but the benefit is made out of the ſeed eſpecially. Time of ſowing. How much ſeed ſowed upon an Acre.

The time to cut it, is when one halfe of the ſeed begins to looke browne, you muſt reap it as you doe wheat, and lay it upon little yelmes, or two or three handfuls together till it be dry, and that very dry too, about a fortnight will dry it, it muſt not be turned nor touched, if it were poſſible, When to cut it.

Place this leaf before Kk Folio 249.

How to use it.

for feare of shedding the seed, that being the chiefe profit of it; about a fortnight the seed will be dry, it must bee gathered in sheets, or rather a great ship saile-cloath, as big as foure or six sheets, and carried into the Barne, erected on purpose, or to that place designed on purpose to thrash it that day; you must have sixteene or eighteen men at a floor, four men will thrash abundance of a day. I have heard that foure men have threshed thirty Coume of a day.

The seed is usually worth sixteen shillings a Coume, that is foure shillings a Bushell, sometimes more, and sometimes lesse.

How much an Acre may bear.

It will, if exceeding good, beare ten Coume upon an Acre, or five quarter, if it be but indifferent, and will not beare above seven or eight Coume of an Acre. It will raise a good advance upon your lands.

It is a Commodity you will not want sale of, the greater the parcell is, the better price you will have. It is used to make the Rape-oyle, as wee call it. The Turnep seed will grow among it, and it will make good oyle also, you may sel a thousand pound together to one Chapman, it is best to be planted by the water, or neare it.

It cannot bee too ranke, the Eadish or Stubble will exceedingly nourish Sheep in Winter.

It hath another excellent property, it will fit the land so for corning, for Wheat, it may produce a crop as good, or better then it self, and for Barly after that.

The charge of an Acre.

The charge of the whole Crop, I conceive may come to betwixt twenty and thirty shillings an Acre, and a good Crop may be worth foure, five, six, seven, or eight pound an Acre, the least is a very good improvement, because it will doe excellent well, if well ordered, and a kinde season upon land the very first yeare after recovery, when it will doe nothing else, if it can be but ploughed, when other things, as corne or graine may bee hazarded; and so have you this Discourse, though in much brevity; your experience will teach you what ever here is wanting, and my weighty businesse will not suffer me to supply.

CHAP.

CHAP. XL.

Shews how good a publike Commodity Hempe *is, with the manner of planting.*

AS for Hemp, that is a very good Commodity, and would bee farre the better, but that it is not made ſo Nationall, yet as neceſſary I am confident, as any thing amongſt us is yet; but not being intended, nor incouraged, as a ſtaple or grand buſineſſe as it might, and Flax alſo, and that more eſpecially then this, but both joyned together, and a publike ſtocke erected, either in the general, or elſe in every particular Townſhip; I know not but why the product thereof might not only bring in a conſtant conſiderable profit for the ſtock, and the poor in every Pariſh maintained, both comfortably in a calling and livelihood, eſpecially all women kind, and children, but they fitted and brought up to a Trade and way, that may render them publikly uſefull to the Nation. I ſhould undertake to make it out, that this very way of it ſelfe would doe it, if it would advance the worke. Why ſhould wee runne to *France* and to *Flanders*, and the Low-Countries, and I know not whither, for thred and cloath of ſo many ſorts, and fine linnen; and cordage? or rather, why ſhould we not, if we be at want of Work-men to make out to that worth and goodneſſe, fetch here and there a Work-man from thence, and ſo preſerve, or rather raiſe the Trade wholly within our ſelves, had wee but Law put in execution to conſtraine people to labour, and ſome way to perſwade men to uſe their Lands to the beſt advantage to themſelves and publike, what ſhould wee want? Wee have the Commodity growes exceeding well among us; we ſee wee have and can make excellent good cloath, better for uſe then theirs.

A deſign to ſet all poore to work, and well maintain them

Object. *You will preſently ſay, we want Work-men, eſpecially ſuch as can do it well.*

Answ. To that I shall answer, people wee have enough you will confesse it, and some that can worke well too where is the fault then? I being not a Tradesman can scarce tell you, but onely will desire an answer to this question: and then itmay be I shall resolve you: what hath made cloathing common among us? and made Work-men at it too, but the very Trade of it, the experimenting of it to purpose, the carrying it on with power and purse, that by this meanes, where ever it is planted, there needs no work-folks, they are ready to come from all parts where work may be had, then that is supplyed. It is true, at the first setting up, people are raw, untaught, and not very willing to learne, and may bee (as it ever was) in all new inventions, or setting up new workes, you may suffer some losse and spoyle; yet if this be backed with publicke countenance, and authority; I feare not any suffering at all, but if you should, you are but in the condition of all honest, publike ingenuous spirits.

And secondly, I shall answer, that nothing ever did, or will come to perfection without great experiences, constant practises, and great scrutiny into the bowels of it, and that will draw forth the mystery, and that is the profit and glory of all Trade and Merchandise, and then why we should not make fine cloath, and almost any cloth of our Flax, and raise our Flax to a great betterment too, I know not; I could name many things in *England* now, are made as good with us, as few yeares since wee could not, but were made altogether beyond seas, and we supplyed from thence; but grant wee raise not so pure a Flax, then buy your flax from the East or best Countries, endeavour the Trade of making your finer cloath thence, and your courser from our owne, untill our Flax come up to theirs in goodnesse, which I am confident will refine exceedingly, both in the growth and workmanship of it; however use all meanes as to preserve the Trade of cloathing Linnen, so far as our owne native Hempe and Flax will: I have heard of most pure cloath some Gentlewomen have made of their owne Flax, and Hempe.

I ſhall now proceed to a briefe deſcription of the way of raiſing it. As for the ſeed of it, that is familiarly bought and ſold in all places in the ſeaſon, but the beſt ſeed is your brighteſt, which you may try by rubbing of it in your hand, if it crumble with rubbing, it is bad, but if it ſtill retaine its ſubſtance and colour, it is good. How to know the beſt Hemp-ſeed.

The beſt land for it, is your warme land, your ſandy, or a little gravelly, ſo it be very rich and of a deepe ſoyle, will doe well, as for your cold clayes, as ſome affirme to bee good for Hempe, they exceedingly abuſe the Reader, it is as tender a ſeed as any I know, and to make good my affirmation as to the land, conſider the land where the beſt Hempe of *England* grows, which is upon the Fens and Marſhes, and eſpecially in *Holland*, in *Lincolnſhire*, where the land is very rich, and very ſandy and light; but their moriſh land, though rich, is not good, and yet the very beſt land they can picke there, is but good enough for it, yea that very land they are forced to dung and ſoyl exceedingly too, after two or three crops, or elſe it will not doe; Nettle-plots, and Thiſtle-plots, and land over-growne with the rankeſt weeds, if well purged there-from, will doe exceeding well for Hempe. Beſt Hemp-land.

The quantity that is to bee ſowed upon our ſtatute Acre is three ſtrike or buſhel, and harrowed in with ſmall harrows, the which after the land is made exceeding fine, as the fineſt garden, then, in the beginning and middle of *April* is the time they ſow it; ſome ſow it not till the end of *April*, but if it be any thing a kindly yeare, the earlier the better, and ſo preſerved exceeding choicely at firſt, for feare of birds deſtroying of it as you ſee in many Countries; but yet there where they ſow ſo much they never value it, bee carefull that cattell neither bite it, nor lye upon it; for though ſome ſay it matters not for being kept from Cattel, ſo they may ſave the fencing of it, yet I ſay if it bee either bitten, or elſe but a beaſt lyeth upon it, after it is come up, it will deſtroy it. The quantity, the time of ſowing of it. It muſt be fenced.

The ſeaſon of getting of it is firſt about Lammas, when a good part of it will be ripe, it may be about one halfe, that Times of getting it.

is a lighter Summer Hempe that beares no seed, and the stalke grows white and ripe, and most easily discernable, which is about that season to be pulled forth and dryed, and laid up for use, or watered and wrought up as all housewives know, which you must pul as neatly as you can from among the rest, lest you break it, for what you break, you utterly destroy, and then you must let the other grow for seed until it be ripe, which wil be about *Michaelmas*, or a little before, may bee a fortnight before (when seed and stalke are both full ripe, and you come to pull, you binde up in bundles as much as a yard band will hold, which is the legall measure; but for your fimble or Summer Hempe, that is bound in lesser bundles, as much as may bee grasped with both your hands; and when your Winter Hempe is pulled, you must stocke it up, or barne it, any way to keep it dry, and then in the season of the yeare, or when you please, thrash it, and get out the seed, and still preserve your Hempe till you set to the working of it, which instead of braking and tewtawing of it as they doe in most parts, there they altogether pill it, and no more, and so sell it in the rough; but I leave all at liberty for that, whether to pill or dresse up by brake and Tewtaw.

How much the statute requires in a bundle.

As for the seed an Acre will beare, is two or three quarter, and it is there sold but usually about a marke a quarter, sometime ten shillings, and sometime lesse; this yeare it was sold for twenty shillings a quarter, if good great Hemp, then store of seed, else not, but in many and most parts of the Nation it is sold for about four shilling a bushell.

What seed is worth.

Your fimbled Hempe is not worth above halfe so much as your other, sometimes it is subject to weeds, to carlock and muckell weed, which must bee weeded, but the best way to destroy them, is to let your Hempe-land lie one yeare fallow. I onely speake of *Holland*, the cheapest place for it, and the first fountaine of it, but generally throughout the Nation, it is of far more worth and value.

The richer your land is, the thinner, the poorer, the thicker, you must sow. One Acre of good Hempe may bee worth five, six, seven or eight pound an Acre, & sold as soon

The best land for Hempe.

as

as pulled, and gathered; but if it be wrought up, it may come to eight, nine, ten, or twelve pound, or more, it is a common thing in uſe, every one knowes the manner of working of it to cloath.

It maintaines many people in a good imployment, and ought to have more publike incouragement given to it, not ſo much becauſe of its advance of land, as the poore people of the Land.

CHAP. XLI.

Onely ſpeakes to the husbandrying Flax, ſo as to make it come up to as much of the improvement as wee can.

FLax, it is a very good Commodity, and I ſhall endeavour to incourage all ingenuous men, that delight in the common good, thereto, as much as may bee; eſpecially all ſuch as have ſuitable lands therefore, upon this account, becauſe it is, as I may call it, a root, or foundation of advantage, upon the proſperity whereof, depends the maintenance of thouſands of people in good, honeſt, and laborious callings: and were but this very peece of husbandry advanced, the ſowing and raiſing of it, according to the capacity the lands of this Nation will afford; I dare affirm to hold it forth againſt the ſtouteſt opponent, that it would maintaine neare all the wanting people of this Nation. A volume is too little to containe this vaſt Diſcourſe; yet take an abſtract of it, which for the more methodicall demonſtration, ſhall be held forth under theſe heads:

1. The ſeverall Lands capable of improvement hereby.
2. The many people capable of imployment hereby.
3. The beſt experiences of planting and raiſing to the beſt advantage.

4. The profit accrewing there-from both general and particular.

Fitteſt flaxe Land.

1. As for the land, capable of raiſing good flax, is any good ſound Land, be it in what Country ſoever it will, if the land be good, either earthy or mixed of ſand or gravel; and old land, it is the beſt, that hath lyen long unplowed, it had need come up to the value of a mark, or neer twenty ſhillings an Acre, that is your kindeſt flax-land, but I know where they give three pound an Acre to ſowe flax upon, within a mile of *London*, and yet in moſt Counties of *England*, I know as good and kind land for that husbandrie, as any other, and at *London*, they have work-men dearer too, and yet can raiſe (though they give ſo deare) a very conſiderable profit out beſide.

3. l. given for flax Land.

Again, any of your good Arrable, that is in good Heart and rich, that is perfect ſound drie Land, is perfect good flax land. Some parts of *Eſſex*, from *Bow* and *Stratford*, down along the way, by the Marſh ſide, a great part of up-land thereabouts, is good flax Land, ſo is there very much in *Kent*, all along on the other ſide the river by the marſhes ſide, is good naturall land thereto; in very many parts, about *Maidſtone* in *Kent*, where the beſt thred is made of *England*, is excellent good flax land: ſo is there alſo in moſt Counties, as *Warwick-ſhire*, *Worceſter-ſhire*, *Northampton*, &c.

The ſeveral perſons that flax imployes.

2. And that I may give the more incouragement here to ſpin, I ſay, as heretofore, it is a commodity that will ſet abundance of perſons upon an honeſt and profitable calling, from the firſt preparing the land, untill the fruit of your labours comes in; one acre of good flaxe may maintaine divers perſons to the compleating of it to perfect cloth: Conſider how many Trades are ſupplyedhereby.

1. The Land muſt have the ſame husbandrie of plowing, harrowing and ſowing, as lands have for corne, theres the husbandmans buſineſſe, ſometimes, yea many times weeding too, then pulling, ſtitching and drying, then rippelling, and laying up and preſerving the ſeed, then watering it either on the ground, or in the water, then drying it up, and houſing it. and kilne-drying it, then breaking and towtawing

ing it, then hetchelling and dreſſing it up, then ſpinning of it to yarne or thred, then weaving of it, and bleaching, then it returnes againe to the good houſe-wives uſe, or Seamſter, and then to the wearing and uſage, and all theſe particular imployments be upon this poore buſineſſe, halfe a dozen good callings and imployments this makes out, and therefore many perſons it will imploy, and we both want cloth and our poore worke.

How to raiſe the beſt flax.

3. Now as to the carrying on this deſign, and making the beſt of this improvement, I ſhall here give in the beſt approved way of planting of it, as is yet diſcovered; as for the Land, let it be good and well plowed, both ſtrait and even, without balkes, and in due ſeaſon, about the beginning of *March*, or the latter end of *February*.

Beſt flax ſeed.

And as for the ſeed, the true Eaſt Country ſeed, is far the beſt, although it coſt very deare, one buſhel of it to ſowe, is worth ten buſhels of our owne Country ſeed; but the ſecond crop of our owne, of this Country ſeed, is very good, and the third indifferent, but then no more, but againe to your beſt ſeed.

The quantity of it is about two buſhels upon an Acre at leaſt, ſome ſow a pecke more; but I conceive two may bee enough, but of our ſeed it will require halfe a ſtrike more then of the Eaſt Country ſeed, you may buy it in the Seedmens ſhops at *Billingſgate*, our Flax-men in former dayes did not ſow above halfe ſo much, or little more, but now their experience hath brought them to this pitch.

An experiment of both ſorts of ſeed.

At my firſt knowledge of the Eaſt-country flax ſeed, for the perfect diſcoverie of the goodneſſe of it, I ſowed one land, the ridge or middle of the Land with our own Countrie ſeed, and both the furrowes with this Dutch or Eaſt-country ſeed, our ſeed was incompaſſed with this, as with a wall about it, it ſo much over-grew it in height.

The ſeaſon for ſowing flax.

The ſeaſon of ſowing of it, if a warme ſeaſon, in the latter end of *March*, but in the warmer parts, as *Eſſex* and *Kent*, I conceive mid *March* may doe well, but in colder parts, as downe towards *Warwick-ſhire*, and *Worceſter-ſhire*, the beginning of *April* may be early enough, and if it

ſhould

ſhould come a very wet ſeaſon, you muſt take care of weeding of it alſo, and in the ripening of it, you muſt be careful, that it grow not til it be over-ripe, leſt the ſtalk ſhould blacken or mildew, yet to his full ripeneſſe you muſt let it grow, the which you may perceive both by the harle, and by the ſeed, ſome will ripen earlier, and ſome later, as you ſow it earlier or later, but againſt it be ripe, be ſure to have your pluckers to fall in hand with plucking of it, and then tie up every handfull, and then ſet them up upright, one againſt another, like a Tent, till they be perfectly drie, and then get it all into the barne, or where you pleaſe to preſerve it for uſe, it is indifferent whether you ripple it, or take off the boles of it, as ſoone as you bring it home, or when you intend to uſe it.

The manner of watering of it.

As for your watering of it, whether in the water or upon the Land, that I ſhall not determine peremptorily, but thus much I ſay, that both may doe well, and he that gets ſtore, will find uſe of both: becauſe of the one, you make uſe as ſoone as your flax is pulled, and then you need not ſtand ſo curiouſly upon the drying of it, but after you have got your ſeed, you may water it, and the watering of it, opens, and breakes the harle the beſt; but then you muſt be carefull of laying up your ſeed, that it heate not, nor mould, and that which you water then, may be a winters worke for your people untill the Spring come on, and then get it forth upon your graſſe Land, and ſpread it thin, and turne it to preſerve it from mildewing, and keep it ſo untill you finde the harle bee ready and willing to part from the core, and then drye it up and get it in for uſe.

As for the drying of it, a kilne made on purpoſe is beſt, ſo that you be carefull of ſcorching of it, this will make great riddance of the ſame, and to them that have great ſtore, ſunne-drying will never doe the feate, though it may doe well for a ſmall quantity, or the flax of a private Family.

As to the working of it, you muſt provide your Brakes and Tewtawes both, the one, and that is the brake

brake which bruiſes and toughens, the harl, and the Tewtaw that cuts and divides out the coare, if you uſe the Tewtaw firſt, it may cut your well dryed flax to peeces, yet both do beſt, yet the brake firſt.

Theſe things are common and known to many in moſt Countries, but not to all, and leaſt to thoſe that have Lands moſt capable thereof.

It will coſt the workmanſhip of it, betwixt three and four pound an Acre to bring it up to ſale, it lyeth much upon the workemans hand, and therefore farre more to bee advanced, by how much the more it raiſeth imployment, for many people to live thereby. The charge of the flax from the beginning till it come to the Market.

Where wages is great, it cõmes off the hardeſt; yet where it is carried on to purpoſe, people ffock hard that want worke, and becauſe of conſtancy, will worke at eaſie tearmes, elſe how could they poſſibly doe good of it at *London*, or neer about it, where they work at double rates, but there have I ſeen the beſt flax I ever ſaw.

4. Laſtly, the benefit that may be made hereby, an Acre of good flax, may be worth upon the ground, if it be the firſt Eaſt-Country ſeed, ſeven or eight, yea, poſſibly ten or twelve pound, yea, farre more, the charge whereof beſide the ſeed, untill it bee ripe, may not be above ten ſhillings an Acre, which if you worke up to be fit to ſell in the Market, it may come up to fifteen, or ſixteen, or neer twenty pound in the market, but to bring it ſo high, as thirty pound, as in *Flanders*, I dare not ſay.

But an Acre of our Country ſeed, will hardly come up to above three pound or foure pound an Acre, unleſs very good indeed, to which if it amount unto, and no more upon the Land, it will make a good advancement of the Land, which may be, Land, and Seed, and all charges, may come to about fifteene or ſixteene ſhillings an Acre, the ſeed being not worth above two ſhillings a ſtrike.

I ſhall ſay thus much more, that I verily believe wee are not come up to that perfection, we may attain unto in this myſtery, becauſe I have heard of ſome Gentlewomen, that

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have out of their own Flax and Hempe drawn out a thred exceeding pure, as pure and fine againe as our ordinary Traders therein doe, and have made as much more cloath of a pound of both, and that both ſtrong, and more ſerviceable, then the ſtrongeſt and beſt Outlandiſh Hollands; and I am confident, if this myſtery doe but receive incouragement from Authority, and it made more tending to publike good, the maintenance of the poore in worke, and ſequeſtring the Trade ſo far to our owne proper Natives, as may be a ſufficient Magazine of work for them. I am ſure we have lands ſuitable enough to bear it, and to afford ſufficient profit, and will be a conſiderable advance unto the lands throughout the Nation.

The Flax and Hempe-trade not come to perfection.

And ſo I hope I have ſupplied in ſome meaſure, more of our deficiencies that really are, and are ſaid to be in our *Engliſh* Husbandry.

The

The ſixth, and laſt Piece of improvement is for the diſcovering what great advance may be made upon our Lands by a Plantation of ſome Orchard-fruits, and ſome Garden-commodities.

CHAP. XLIII.

Treats how our Lands may be advanced by planting them with Orchard-fruits.

AND for making good the Improvement promiſed, I ſhall ſhew theſe two or three things. 1 That abundance of land is planted in many parts of this Nation, and thus improved. 2 That there is land, and very much, in all other parts that may be improved. 3 The fruits eſpecially, by which they come to ſuch an improvement.

1 That there is ſuch land already improved, none dare deny; to that height as is affirmed, many will queſtion: I therefore doe in briefe affirme for my preſident, that, *Worceſterſhire*, part of *Gloceſterſhire*, and part of *Herefordſhire* will ſpeake out this truth, ſome men having their Plantations, both of Apples, Pears, and Cheries, and ſo ordered that they hinder no more the growth of graſſe then the compaſſe of a tree that grows upon it; nay, ſome queſtion whether with their ſhadineſſe in Summer, and warmneſſe in Winter, they better not the land farre more, and their very growing

What parts prove the improvements.

upon it doth not inrich it, they having usually the earlieſt graſſe, and many times the greateſt ſwath and burthen, and will keep more cattell too. And certainly where they are formally planted, and grow not too thicke, I cannot ſee reaſon to the contrary. As for the land, I know very much, if not moſt of it, was worth, not above tenne ſhillings, ſome leſſe, or thirteen ſhillings foure pence an Acre at the firſt; now the graſſe of moſt of them thus regularly planted, and drawne as they grow in bigneſſe (that ſo they may never grow to touch one another by a good ſpace, when they come to the beſt age, for when they come to decay, plant new ones in their roome, and downe with them to the very ground) I ſay the graſſe of ſuch Orchards or Paſtures is worth thirty ſhillings, ſome forty ſhillings, ſome fifty ſhillings, and ſome more, and the fruit that groweth upon the Trees planted therein, may yeeld ſome three pound, ſome five pound, yea, ſome will come up to ſeven or eight pound an Acre.

What Nurceries of young Trees may improve.

But come you up to *Kent*, *Eſſex*, *Surry*, *Middleſex*, and part of *Suffolke*, where naturally the land was worſe then in thoſe parts by farre; I dare affirme there are many Orchards planted there upon land, that was not naturally and really worth above ſix ſhillings, or eight ſhillings an Acre, when they began the work, and that ſome thouſands of Acres too, and with ſome good ſoyle, and good husbandry, dividing, quickſetting, and laying dry and ſound their land, and gardening ſome, and planting others with kernels of all ſorts of fruits, and all ſorts of woods, and ſets, and trees, have brought many plots, ſome containing five or ſix Acres, ſome to ten, or twelve, and ſome to twenty or thirty Acres, in one plot, to that improvement that they have made twenty pound an Acre, yea, if I ſhould ſay forty or fifty pound, I ſhould finde ſufficient teſtimony to the truth hereof, and all this while but in preparation for a plantation too, their young trees being not come yet to beare, nor to ſhade the land, and then they lay it downe to graſſe; but ſay the land was worth twenty ſhillings an Acre, and ſome is, and very much worth more, which ſo much

better

better it will proſper, and ſo much leſſe coſt need bee beſtowed, and yet by all, will be made good the Improvement promiſed. Theſe Orchards many of them are worth to graſſe forty, fifty, or three pound *per* Acre, and ſo ſet; their fruit will ſeldome yeeld them ſo little as double or treble the worth of their graſſe, many times five or ſix fold, yea, poſſibly ten fold; and what is this towards the making good my Improvement promiſed?

How land is improved to twentyfold by Orcharding.

If this land was not worth above ſix or ten ſhillings an Acre, as very much was not, then it is fourfold doubled in the grazing, and if it treble in the fruit, then there is ſixteenfold, and if it come up to ſixfold in the fruit, then there is two and thirty fold. I will go no higher, but I might, and many doe and will, the coſt beſtowed, for the two, three, or four firſt yeares may be was three or foure pound an Acre, may be five pound, but then the Garden fruits which they raiſed upon them, the ſets, the grafts, the trees, and fruit they raiſe upon it, may bee poſſibly worth as much more as it is worth, when it comes to be laid downe to graſſe, but then it coſts no more then mowing their graſſe, and gathering their fruit; and yet during the flouriſhing condition of this Orchard, it ſhall hold forth the Improvement aforeſaid.

Object. *But ſome will ſay this may be true in ſome few Acres, and by ſome few excelling husbands, but in very few perſons, and upon fewer lands.*

Anſw. If in any, why ſtrive not others? after the ſame pitch, why runne not others to the ſame mark? if one Acre, why not two? if there be one ſo good a husband, why imitate wee not him? wee know one man may have as good meanes to the ſame end, as another. If one Tradeſman get an excellent commodity, or attaine to an excellent myſtery in his Trade, doe not all men ſtudy it, thirſt after it, and endeavour it, and many gaine it?

One land may improve as well as another.

Object. *You will ſay our land is not ſo good, there is little ſuch, and moſt lands in* England *are not for that uſe, and in ſome Countries little or none at all.*

Anſw. To which I anſwer; neither was theirs as good, or knowne to bee ſo good (and that is all one) untill they made

Very much land may improve as well as that which is improved.

made the experiment. It is but very few ages, since these Countries have been so famous; every age hath exceedingly improved, and this very last age as it were almost doubled what former ages came to; and truly when you have made the same experience, you will finde your Land as good, and by good husbandry with a strong resolution to the same end, will bring forth the accomplishment of the same fruit; and so I shall proceed to an answer of the second part of the objection; which is, there is little such land, or little fit land for this use in many Counties in *England*, which brings mee to my second particular which is to shew that there is land as well in all Countries, and Counties, as those lands of *Kent*, *Essex*, *Surrey*, *&c.* and very much in many, where is no improvement at all made thereon; and that I thus demonstrate, by inquiring into the nature and qualifications of these lands, and these lands are many of them exceeding dry, sound, warme lands, some perfect sand, some gravelly, some of a very shallow mould, not above halfe a spades pitch before you come to hunger and barrennesse, some exceeding stony, some of them are upon a very rich soyle, as by the Marshes sides, some of them are upon a cold, spewing, wet, clayey land, but made rich, and warme by soyle and husbandry, and some upon a perfect clay, cold and barren; and yet upon them all, you have exceeding great advances, as aforesaid.

Object.

Answ. 2. The natured lands upon which the chiefest fruits doe grow.

And that there is some such natured lands in all Countries, and in some all these natured lands directly, no man will deny, and also meanes and soyles to inrich them, though not so much; but yet I am sure many times more then is improved to so good an advantage, and more may be made, and gained to inrich them, if we grow industrious. And now that I have proved there is such natured lands, what remaines to cleare the full demonstration, but that as great advancement may bee made in those Countries, as in these.

Ans. 3. Lands of the same nature may raise the same improvement.

Obj. *Why this remaines, that they are not under so warme a Climate, as those Lands are, which is true, and this is all that can be said, to which I answer.*

1 *Answ.*

1. *Anſ.* That the climate is much to the drawing forth theſe fruits, and eſpecially to the drawing them forth ſo early, but yet not ſufficient excuſe to hinder the work, for then why ſhould *Gloceſter-ſhire*, *Worceſter-ſhire*, and *Hereford ſhire* be ſo famous; I am confident they are as natural and as fruitfull this way, as theſe Countries are, only I believe they are not ſo quicke for ſale, nor ſo early ripe, may be by a fortnight of dayes, which is nothing.

The Climate but a very ſmall hindrance.

And the climate is as cold in theſe Countries, as in almoſt any, except two or three of the Northern Counties, in which Countries are very much good fruits, and many good Orchards too, and why not more I know not, I doe confeſſe Cherries grow upward, more rich, early, and more profitably, then in other parts, yet *Worceſter-ſhire* comes neere them, but what if they come not up ſo high? they may come up high enough, and we ſee they will grow well, and to good profit in other parts, as well as here. But ſay there was not a cherry growing in any of thoſe parts: I ſhould not much matter, they being only for delight and pleaſure, yet if good Peares for Perry, and Apples for Syder would proſper well, which I am confident they would, if induſtriouſly experimented, which would be for the great ſupply of the poor & the whole Country, for every Town and Houſe almoſt hath an Orchard bigger or leſſer, that do, and will bear both Apples and Peares of all ſorts whatſoever, and all Countries have Lands naturall therefore, as well as theſe, where there is ſo great improvements made, and therefore I know neither nature nor reaſon againſt the ſame, nor nothing elſe but ignorance, ſloth and prejudice, and ſo farre as I know, or I believe any man elſe knows, there is Land enough in every County, ſuitable hereunto, however to make a very ſubſtantiall and gallant improvement, if not altogether ſo great as theſe. And as for the ſale of them, or Perry, or Syder, we need not much trouble our ſelves, nor hinder our improvements thereby, untill our ſelves, our Neighbours, and the poore about us are ſupplyed, and then, when wee have it to ſpare, to ſell it; it may bee tranſported much by water, and many places by Cart to places of

Sloth and ignorance the greateſt hindrance of improvement.

vent, whereas some of it, and that most excellently made, (these daies will teach us) may be sold for Wine, and in thousands of places now it is; and serves as well as that, for men to fox their noses, betoole themselves, and waste their patrimony: And so I hope I have sufficiently proved the capacity of advancement of many thousand acres of Lands, upon this account: yea, the great advance might be, if you planted but all your barren and empty hedges with good fruit Trees, and so I descend to my last particular, which is:

Thirdly, the speciall fruits I intended, and they were these five: 1 the Vine, 2 the Plumbe, 3 the Cherry, 4 the Pear, and 5 the Apple.

First, As to the Vine and Plumbe, I intended not them directly upon this account, as to the great advantage their plantations would raise Lands unto, because they would bee confined to lesser quantities of Land, but chiefely to shew the advantages might be raised through their own plantations.

That Wines may be made in England feasibly.

And for Vines, in relation to themselves, I did intend a large discourse, whereby to have presumed to have raised a publike experimenting of them to this effect, as thence to have raised good and usefull Wines, which that it may feasibly be done (in this season of Wines dearth) I have these two grounds:

1 Because the South-west parts of *England*, are within one degree South of the Northern parts of *France*, as *Bramont*; yea, the very Latitude of *Paris* it selfe, is not two degrees South of us: but,

Secondly, and chiefely, because it hath been made already in many parts, as in divers places in *Kent* and *Surry*, and many other parts, as old Chronicles report, and that frequently, and may unquestionably be raised, in case wee faile not in the advancement of the Plantation, but hit that right; But for a weighty reason hereafter discovered, I shall say no more.

But for the three last, the Cherry, Peare and Apple, I had absolutely resolved to handle them at large, in the whole mystery of them, both in Setting, Planting, preserving, pressing, barrelling and Merchandizing of them, to clear up the great advance Lands may bee raised to by their Plantations; but that in this very interim, whilst I was about the very work, Mr. *Samuel Hartlib*, that publike

like ſpirit, ſent mee in this aſſurance, (with his deſire that I would not publiſh it to the world) that an *Oxford* Gentleman, called *Ra. Auſten*, an Artiſt both learned and experienced, had finiſhed a Work fit for the Preſſe, of approved experiments in Planting late Fruit, from better Rules than have hitherto yet been publiſhed, of which taking notice, I was moſt willing (not onely to publiſh, but) to imbrace the tender, upon a double ſcore:

Firſt my owne, and ſecondly, the publike advantage.

1. My own advantage is great, (being tyred out with journyings and travels, to evidence my experiences the more candidly to the world) to be eaſed from the Writing thereof, by one better able to hold it forth, having made it his Maſter-piece, both of ſtudy and recreation: A brief diſcourſe whereof would have made a conſiderable Book.

And Secondly, upon the publike advantage too, who hereby are like to communicate in a more full and copious diſcovery of the Art and Myſtery thereof, from him that hath ingaged ſinglely in this buſineſſe, rather then from my ſelf, that could but confuſedly, and not have been ſo large and full as hee may bee: Beſides, this pregoing piece of mine (though poſſibly of little worth) might have ſtifled a better and larger in the birth, upon a diſcouragement, leſt the free ſale thereof might in ſome meaſure, have been retarded hereby. I therefore durſt not neglect to receive the motion with moſt reall and candid imbracings.

CHAP. XLIV.

Shall containe a brief diſcourſe of ſome choyce and more generall Garden Fruits, intended to have been ſpoken to more largely.

AND they were ſix, 1 the Cabbage, 2 the Carrot, 3 the Onion, 4 the Parſenep, 5 the Artichoake, and 6 the Turnep.

In the diſcourſe whereof I ſhould have ſpoken diſtinctly as I could, and have laboured to have laid naked the Myſtery of each of them

with the best and latest husbandrying of them according to use and exercise of out now present art of Planting; but expecting it more large in all the members and branches, thereof from so learned and experienced a hand, who undertakes the taske, the art of Planting singlely of it selfe, I shall hope to have discharged my promise better by my silence, then in holding them forth under so briefe, and confused discoveries, as I have done many other in my foregoing Discourse, and should for want of time been forced to have done these.

And so I shall conclude all, and my whole Discourse with a few words to my maine scope and aime, which is to affirme and prove, that by these Plantations, Lands may come to a very great advance; yea, unto as great as the greatest that is affirmed in my Frontispiece; but yet never to that height, as some have fondly imagined, and doe affirme in words, and have done in Print, they can raise land to, many whereof are from severall sorts of Garden-commodities, as from some of these, and from the great million Pompion, which I least matter to owne of all the rest, I being once so weake as to come to an agreement with *Mr. Speed*, who writes such high things, as reason cannot fathom, to discover his particulars to me, which he gave me in writing, some whereof were some of these Garden-Commodities, and another the planting of Conies upon hard land, all which (except the Pompion) were as well knowne before to my selfe, as to him, but not, that from them to raise so great advantages, I never knew, nor shall: and some other things, hee told me of, as laying up coals at *Newarke* in a deare time, which I fear the Merchant hath found out that, and to keep them till they grow scarce, and ingrosse them, and hold them up to an exceeding price, but of the manner how this must bee done, and some few other things, promising him not to reveale them to others.

I will say no more; for in regard I never practised them, I have forgot them, and so shall leave my Reader to search for them from himself as well as I, who certainly now must needs

needs have made more full experiences of them, it being neere two yeare ſince I had firſt acquaintance with him: but the aforeſaid being my owne as well as his, and all mens as well as ours, I ſhall make bold to diſcover them to my intendment (for as to his I ſhall never attain) and that is to incourage their Plantations, becauſe Lands may be highly advanced by them, and when thou haſt the Art of planting diſmyſteried to thee at large, as will be very ſhortly, fall upon them.

Charges and hazards in gardening, cuts the comb of its greateſt hopes.

And becauſe Land of great quantities cannot be advanced to that height, as leſſer parcels, which are within the power and purſe of the Gardner, which with his conſtant paines, watching, toilings, hazards and adventures, he runs, he may make one hundred pound poſſibly out of ſome one Acre of Land, if his commodity proſper well, as ſome have done; but in the caſe of non proſperity, ſome are half undone again, as if it thrive not exceedingly in the growth, proſper not as well in the ripening, eſcape froſt, and thieves, and meet not with a good market, what it wil come to then I determine not, neither doth Mr. *Speed* conſider of theſe things, and how then it would do, when thouſands of Acres ſhould come to be planted therewith I know not, Iſhal leave it to him to reſolve, and onely take out Turneps, mainly intending my deſigne, which will be ſowed at ſmall coſt and charge, and grow upon indifferent Land, and bring forth great increaſe, and are of more generall uſe: and in caſe much Land be ſown therewith, and they come to ſo great plenty, that the Markets will not carry them away, at ſuch a proportionable rate, as the Gardner can afford them, then may they be diſpoſed of, to the feeding of ſheep, and Cattel, which they will doe, and to good advantage too: and in a deare yeare, to make bread thereof, halfe meale, half boyled Turnep, mixed and wrought together into dough, and kneaded and made into bread, will make a good and delightfull food, as hath been by many experimented already; yea, as Sir *Richard Weſton* affirmed to my ſelfe, he did feed his ſwine with them, though all men hold the contrary, that Swine will not eat a Turnep, (ſo I ſay too) no

How Turneps will help out the improvement though Markets faile. How Turnep makes bread in a dear year.

How Hogs may be kept and fed with Turneps.

no more then a Scot will Swines-flesh, yet the boyling them at first, and giving them to his Hogs in good wash, and afterward all boyled, that at the end they came to eate them raw, and would runne after the Carts, and pull them forth as they gathered them.

So that upon these accounts, and becaufe I know it will bring Land to a good advance, as unto 8. pound, 10. pound, or possibly 12. pound *per* acre, I propose this especially; but for the fuller discovery hereof in the mysterie, I leave that to be more fully discussed in the Art of planting, and should that faile of seasonable comming forth, or of a full discoverie, it is but about eight or ten quarts of seed sowed upon an acre of dry sound land, indifferent rich land, well plowed, digged and harrowed, as for corn, & then after sowed thin, & even, with some composition with it; and then slightly covered with a bush, some sowed early, where the land wil do, & some late, when other crops are off; & selling them, or spending them at a Market-price, they will bring forth the advantage promised, and so I have indeavoured to supply this deficiency in husbandry, also in some poor measure the want of improving our garden-fruits, our Lands being as capable of improvement this way, and as high, as is by their Brabant husbandrie, and so am come to my desired end at last, all which I commend to thy patience, and thy self, and it to the word of our Lord Christ his blessing.

What Turnep seed sowes an Acre, and how to order it throughout.

FINIS.

AN

Appendix, or Postscript,

Humbly remonstrating unto any of the Honourable Committees of of Parliament designed, or that hereafter may be designed for taking of Grievances,

Promoting the Common-good, Advancing of Ingenuity, or for Regulating Forrests, Wasts, or Commons within this Common-wealth.

1. I Humbly affirm, that all Lands, and the advantages thereof are the Common-wealths in generall; and were they all as one mans, they would be incomparably more improveable upon some Accompt, and yet being every mans Land in particular, why the Generall should give way to a Particular, I know not; yet I shall humbly desire, that the Less may give way, upon satisfaction given, to the Greater Improvement.

2 I say that great parcels of Lands are also upon another Accompt improveable by divisions into lesser, and that divers wayes; and yet it shall not overthrow my first assertion neither; every thing being beautifull in its season: Therefore if all Lands within these great parcels were first cast out, as are under the first capacity, which by floating or watering may be improved, which is the certainest without hazards, and the greatest Improvement I know of in the world; and then let all other parcels whatsoever come up to those places of Improvement also, that Art or Nature cannot bring to this; well knowing, that many littles make much, and easier to improve a little by every hand, under every opportunity, than much by few. Let men of great Estates, who because of the greatness of them are most capable of Improvement, mind this design, which may be no less seasonable to the Forrest Improvements, if so cast out at first; An unknown Advantage.

3 I say, that very many Wasts, Forrests, Moores, Commons, and Common-fields, as they are now enjoyed through the oppression of the Rich, the sloth and idleness of the Poor, and the misuage of all, are of little advantage to the Common-wealth, being commonable, at random: Nay whether they are not worse than nothing, some years yeelding profit and increase, and other years sweep clean away increase and old stock both, I leave to the wisest to judge: I am sure I know upon some, yea most common fields, the poorer sort are forced to more charge in keeping their Cows, Horse or young cattell, than they might lay forth their cattell in pasture: My eyes have many a time seen one person employed all day in tending one or two beast, whose wages could not be less than three shillings the week, of whose labour the Common wealth is deprived too hereby; and for two shillings the week, or less, I would have had three beast grazed in pasture, and after this rate have I seen many men, women, and children em-

ployed

ployed, which puts into my mind the fulleſt Anſwer to that grand Objection againſt Encloſure, or Improving Commons: How then ſhall ſo many people be employed, now one Town maintains many great Families, and many Families live upon the Common, which then muſt ſhift and go a begging. And that I may manage this Objection a little to purpoſe, the great Remora to this Improvement (all other Objections ſeeming to me in compariſon of this as nothing.) Moſt men herein being much be-clouded, and very many wiſe men ſo charitably betwitched herewith, and I could wiſh all our Governours were clear ſighted herein, becauſe ſo great an Advance goes on ſo ſlowly. I therefore demand,

The great Objection againſt Encloſure.

1 How theſe people live. Live they do indeed very many, in a mean low condition, with hunger and eaſe; better do thoſe in *Bridewell*. And for the beſt of them they live as uncomfortably, moyling and drudging, what they get they ſpend; Plow, Sow, and Reap, and all to bring the year about; and can they make even at years end. if ſervants wages can be payd, Rent diſcharged, and Teems maintained, and Family alive, all is well. I dare ſay fewer Eſtates are raiſed, though in it ſelf an honeſt calling, than by any calling or employment whatſoever: *Whiſtle it in, and whiſtle it out*, as the Proverb is.

Anſwer at large to that great Objection.

But ſecondly, as aforeſayd, many of theſe people are imployed, but to loſs, and very great loſs too, when their pains and charges is far greater in keeping their cattle in Balkes and Hades, by Corn ſides, in Highwaies and Lanes than they might have them paſtured for.

Thirdly, what are the people fitted for hereby? are they not more fit for any Impreſſion of baſeneſs than ſerviceableneſs to the Common-wealth; and I wonder that perſons, their bodies and ſoules are of no better vallue than a beaſt, which though they be not among the ruder, let them be among the wiſer.

Fourthly, Incloſure will bring far more, and that honeſt ingenious employment; ſome by diviſions, which will lay the land both warm and dry; others by quick ſetting, planting of Woods of many ſorts; fruit trees for Perrey and Sidar, and Garden-roots; improving ſome by Watering, ſome by Drayning, others by Corning, upon perfect, compleat Tilth and Soyling, which none will wave, it alway bringing great profit with it, others by Flax and Hemp, Clavering and Coleing, and by all the other means held forth in this diſcourſe, whereby they may be really ſerviceable to their generation.

Incloſure may maintain more people than in common tillage.

And this I do affirm, that many more people may be employed this way than now are, and doubly as many. Indeed the Oppreſſor may a little be prejudiced by this Curb, but none elſe.

Fifthly, view all Incloſed countries (not particular Townſhips, curſed for depopulation ſuch abhominate) but take whole Countries, more wealth, more people, were not all common once, and are we not more peopled now than ever?

And laſtly, for thoſe which live meerly upon the Commons, if they have a proportion allowed them to themſelves, as all honeſt ſoules deſire, I am confident it will wean many from their Idleneſs and Theevery too: the work that will neceſſarily ariſe out of the Incloſure and profits of the reſt will give them ſuch an opportunitie of a full employment, and then who will not work, then let them be compelled by *Bridewell*: I rather much fear want of Workmen to do the work, than want of work for poor men, when Improvements come in faſhion; there will be work for young and old, ſtrong and able, all ſorts of work for all ſorts of perſons will Improvements bring; yea to children of ſix or ſeven years old, by planting and ſpining; and ſo I hope with all my aforeſayd Arguments in the body of the Book, this cloud may be diſperſed, and my aſſertion cleared.

1. Upon

Upon which consideration, I shall humbly offer further, 1. That every person whatsoever may be enjoyned some particular calling suitable to their place or prinples. The Glory of the Dutch and all Christian Government, is a full imployment.

2. That women of all degrees should give some proproportionable Testimonies of their endeavours too; either so much Linnen or Woollen cloth, or so much Cheese or Butter raised, or something by them brought forth into the publique Bank as most properly belongeth to their Sex to evidence their activity for the publique.

3 That especiall encouragement may be given to the plantations of those things as may prove most nationally advantageous. What if every man that hath two or three Acres was injoyned but every year to sow or plant one Oak, one Elm, one Ash, one Walnut tree, one Chesnut tree, two Crab-tree stocks, to graft one Apple or Pear thereon, and so proportionably to what quantity any man hath of any Lands; and these to be preserved curiously, when they are planted, till they be grown past cattles brousing.

4. That some wise and speedy course be taken that poor children may be educated in some measure in Learning and the Knowledge of God and themselves.

5. That a publick Stock might be raised in every Country or Town to maintain that present body of beggary that now cannot be determined to any place of birth and abiding, and the rest confined to their due places as the Law hath provided; and that henceforth any Parish that should not take care of their own poor, should forfeit soundly: So that at last there might not be found a Beggar in our English *Israel*.

6. That discoveries might be received by men well able to judge of all Inventions or Contrivances for the Advancement of the Common good, either in Lands or Mines, or making Money more plentifull, or Credit instead, if not as good as Mony; and that whatever

ever tends to the Generall Good, ſhould take place of a Particular, and that Will and Cuſtom ſhould not carry it, if ſatisfaction for the wrong received ſhall be given.

7. That all Commons whatever that cannot (with convenience but with apparent loſs to many ſoules) be encloſed, which I think are very rare, may be ſtinted or limited to a ſet number of cattell, and ſuch a number too as the Lands will maintain to the beſt advantage that Land will afford: A common way of ſtinting is not worth a ſtraw; but were it ſo eaſily laid with cattell as they might be maintained not onely in a living condition, but in a thriving and feeding, then might all Commons be of uſe; then might the poor uſe, or ſet their right for money they are not able to uſe; then would Oppreſſors be held under, and all ſhare in the benefit thereof; this would be one eſpeciall means to be prevent the Rots and Murrens, and abundance of diſeaſes that come by reaſon of penury, and make many poor men live comfortably, that now periſh through oppreſſion.

How Cõmons as grazeable may be as good as free-hold Lands to the poſſeſſor.

And laſtly, that whatever diſcoveries ſhall be made to you, that may make for our freedom of ſpirit, perſon, or eſtates, the ſhortning our toyls, eaſing our burthens, making us a full, free, peacefull, and loving people, and diſcovering to us that light of Liberty and Priviledge that is our purchaſe by and under the Goſpels Glory, may be freely and ſpeedily received, and reſolved and diſtributed amongſt us by you, who muſt give life and ſpirit to them, they now lying as dead bones ungathered, and unbreathed upon.

And if theſe, or ſome of them might but be debated and reſolved into practiſe and experience, what comfort ſhould this poor Common-wealth receive by you that muſt give reall Being to them. I hear of many good informations or diſcoveries, and poſſibly many degrees better than theſe, have been tendred and received

ved from many Committees with good approveance, but layd by as looſe Papers to be conſidered of in duer ſeaſon, but that hath never yet come, and the authors thereby ſo diſcouraged, that they are not only buried themſelves, but their Talent too, and others hands weakned, that would be active both in purſe, perſon, and ſpirit to help on the weal of this whole new frame and change, but that I may prevent miſlaying, and diſcharge my duty, I have taken boldneſs, (if too bold I humbly crave reproof) to preſent my thoughts as an Appendix to my Book that ſo ſhould they be layd by; both may be layd to together, yet ſome other may take them up again, that may be a fitter Inſtrument to remind you of them that will keep them by them ſafe.

For this Commonwealths ſake and the Goſpels too be doing. The proſperity of the one will help on the glory of the other, with your help and Gods bleſſing. And I humbly pray, miſtake not my candid intentions, I know your wiſdoms are able to make forth better and clearer, not only Diſcoveries, but Reallities to us; and many more, more neceſſary of this nature, may be upon your ſpirits, than my confuſed notions can dictate to you; but ſith all Forms, and beſt Regularities came out of confuſion, ſomething may come out of this. I preſent it as my duty I ow my generation. I bleſs God for many of you, and many things done by you; I only bring in my Talents I have traded with, and ſome ſmall fruit I have gained thereby, and leave them with you as Remembrancers at your moſt ſeaſonableſt times to debate and reſolve the uſefulneſs thereof; and yet me-thinks no time ſhould be much more ſeaſonable than this preſent, for us now to caſt to live of our ſelves, and within our ſelves, now providence hath almoſt ſhut us in, and hedged us round about, and that as comfortably as we can too, muſt needs be expedient.

The preſentment of this whole Book unto the world, and of theſe few paſſages in this rudeneſs to your Honours,

nours, should have been in some measure prevented, had I fore-thought, or could I have foreseen my whole design before me; or had not cross providences or issues fallen in unexpected since my beginning this Task, which hath layn so long on hand, and in the press too, as that time, converse with others, and some experience of my own, hath presented fresh supplies; all which hath caused more tediousness, and some confusion, and vain repetition, and many other faults in the indicting, and many in the printing my Reader will espie, but the scope and drift, the sence and end, being chiefly to be intended, which I hope I have not any where obscured. I do confess, and am ashamed both of my weakness and errors, and humbly implore a charitable censure from all ingenious men, especially from your Honours, pardon for this boldness; which being attained, with some Resolves of these Representations, will be the greatest incouragement to the soul of your praying servant, that a free and publique spirit may be enlarged upon you; yea a double spirit on you, again so prayeth

Right Honorable,

Your plain dealing, and

most humble Servant,

W. B.

A

Table of the moſt principall Heads and Branches of this Diſcourſe, as they are layd down under the ſeverall main Peeces of the Book, and illuſtrated in that Chapter diſcourſing each particular Peece.

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Sheweth the antiquity and neceſſity of Huſbandry pag. 3,4,5.

Chap. II.

The cauſes of barrenneſs as they are in men. 6,7,8.

The cauſes of barrenneſs as in the land it ſelf. 9. *to* 14.

The firſt Peece contains the 3,4,5, *and* 6 *Chap.* Treating of the Remedies againſt Barrenneſs, and particularly of Floating and Watering Land.

Chap. III.

Sheweth what Land lyeth beſt for advancement by water. 17.

Of impounding water upon land, & in what caſe. 18.

The Table.

Of what nature the best land for watering is. pag. 19. 20.

Chap. IV. & V.

How and where to begin your first watering, and how to proceed. 21.
How to make the floating and drayning Trench. 22.
What makes the watering land so fruitfull. 23.
The best flowing season upon all lands. 24, 25.
The advantages of watering land. 25.
Presidents of watered land. ibid. & 26.
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Chap. VI.

A larger explanation both of the floating and draining Trench. 27.
How to prevent heaping of the earth in trenching. 28.
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To level by spade, and what a man may do a day. 30.

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To drain a bog, and where the water lieth. 33.
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Floating a bog beſt deſtroyes it. pag. 37.

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Anſwereth ſeverall objections made againſt the probabilities of ſo great advance by floating. 38.

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The beſt way to improve drowned lands. 58.

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Directions to make and uſe ſeverall Tooles or Inſtruments which ſhall much facilitate the work. 65.

The manner and form of a true, and ſpeedieſt Levell that I can deviſe. 66.

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The Third Peece hath the 11, 12, 13, *&* 14 *Chap.* Sheweth to incloſe without offence, and prevent depopulation that is moſt common, attendant, and appurtenant to encloſure, and how to make ſeverall Errable, common field Lands, & common Heaths, Mores, Forreſts, Waſts, to every particular Intereſts, & the Common-wealths great advantage.

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Treateth of Improving Land by Paſture; Reproves Depopulation, proves excellent Advantages by Incloſure, and taketh away the uſuall Scandalls laid upon it. pag. 71.

Chap. XII.

Sheweth the Land capable of Encloſure, and the Method of it, how it advanceth the Publick-Weal and all particulars Intereſts. 76.

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Sheweth the manners of Plowing, and working Lands to ſo great advance, with two incredible Preſidents of Advance. 99.

Eſpeciall directions for Plowing. 100.

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Chap. XVI.

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The excellenteſt way to deſtroy Broom, Goſe, Ling, and Bracking. 124.

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How to reap two harvests pag. 126.
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An unfailing prevention of Crows, Rooks, or Daws, from Corn. 128.

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